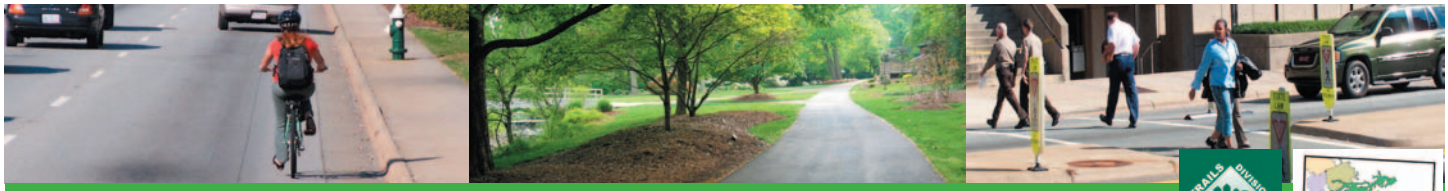


Chapter 4: Recommended Bicycle, Pedestrian and Greenway System

4.1 Overview

As described in the Introduction, the goals of this planning process are to provide safe and convenient pedestrian and bicycle off-road and on-road access throughout the Greensboro Urban Area, including improving connectivity between communities and destination points, improving access for underserved areas, and providing a high-quality alternative transportation system. This overarching philosophy of a hubs and spokes model (Figure 4(a)) has guided the efforts in developing the bicycle, pedestrian, and greenway recommendations. While described separately below, the goal is to integrate bicycle, pedestrian, and greenway components together to form a comprehensive off-road and on-road system. This network would provide accessibility, transportation, recreation, and healthy lifestyle opportunities for all user types.

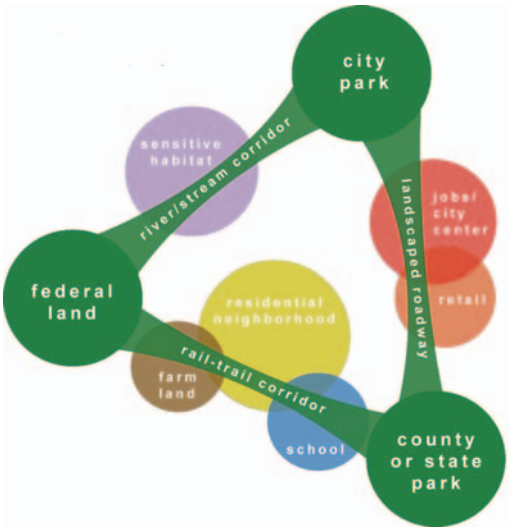


Figure 4(a). Hubs and spokes model.

Another goal of this comprehensive network is to link municipalities and unincorporated areas within the Greensboro Urban Area and also to link with other regional greenway, bicycle, and pedestrian systems such as those found in neighboring MPO's (Metropolitan Planning Organizations) and counties.

The greenway, bicycle, and pedestrian facilities that are proposed in this document are planning-level recommendations (Entire network in Map 4.8). Most of these recommendations will need to go through further evaluation and a design-level analysis before they can be constructed. Facilities should be designed and constructed with the goal of accessibility for all people.

4.2 Greenway Recommendations

A system of nearly 420 miles of greenway has been recommended here, adding to the existing 81 miles in Greensboro, and approximately 100 miles in the Greensboro Urban Area. The recommended system would make nearly 1.2 miles of greenway available per 1,000 people (when using the 2000 Guilford County population of 421,048). More importantly, the greenway and trail recommendations are intended to have coverage over all geographic areas, especially near populated areas.

4.2.1 Methodology

The greenway network was developed using a number of sources:

- Geographic Information Systems (GIS) map layering and analysis
- Fieldwork
- Connections into existing trail system, ongoing greenway efforts, and regional trail systems
- Public input



Public workshops
Community focus group meetings
Online questionnaire
City/County/MPO staff

- Projects listed in previous planning efforts

GIS analysis and fieldwork were the two chief means to develop greenway recommendations. Each method benefited the other by allowing unique and necessary perspectives not found in the other method.

GIS analysis was conducted using multiple data layers in the digital environment. This layering of information allowed a unique perspective and readily presented opportunities as well as constraints. GIS mapped layers used include:

- City of Greensboro existing and proposed trails (including 2000 bond referendum Connector Routes)
- Connections 2025 proposed trail corridors
- Aerial photography
- Roads
- Parcels, including City-owned
- Sidewalks
- Drainageway & Open Space buffer
- Waterways
- Sewer and utility easements
- Old railroad corridors
- Preliminary bicycle network (from this Plan)
- Trip attractors
- Schools
- Office and industrial parks
- Population density

The recommended greenway layer was digitized logically in the GIS environment with many goals in mind:

- Connect gaps between existing and proposed trails
- Develop long-distance greenway spines with spurs off these spines
- Keep greenway system off-road as much as possible
- Avoid private landowner/homeowner conflict when possible and minimize impacts
- Utilize open spaces and common areas
- Take advantage of publicly-owned land when possible
- Connect trip attractors, especially schools, parks, shopping areas, and places of work
- Utilize and/or propose on-road sidewalk sections where necessary to avoid road or private residence obstacles
- Provide off-road options in underserved and high population areas

Several fieldwork reconnaissance efforts were conducted to verify greenway recommendations made in the GIS environment. Recommended greenways were assessed for their feasibility. Existing greenway facilities were examined along with specific sites of opportunity and constraint, such as underpasses, topographic barriers, and easements.

It should be noted here that further investigation and negotiations will be necessary to finalize individual trail alignments and types before trail design and construction can begin. Further investigations into environmental constraints such as wetlands and topography, along with land ownership should occur. Also, the location of alignments may need to be changed due to future opportunities such as new land acquisition or newly added sidewalk.

Finally, previously City-proposed trails, 2000 bond referendum Connector Routes, and ongoing efforts described in Chapter 2 were added to the network. The ongoing efforts include the Bicentennial Greenway, Piedmont Greenway, Mountains-to-Sea Trail, Downtown Loop Trail, Southeast Connector, and Battleground Rail-Trail. Connector Routes are often segments of the following recommended greenways but are also described separately.



4.2.2 Recommended Greenway Facility Types

The greenway facilities recommended for the network are summarized in Table 4(a) (for Greensboro Urban Area) and Table 4(b) (for City of Greensboro - inside Water/Sewer Boundary) and described in detail below. Each of the facility types is appropriate for different routes, depending on local need, and land use characteristics. Trailheads are described later. Acquisition, environmental assessments, and master planning for these facilities will more accurately and specifically recommend facility types.

Existing Greenway Network (MPO)		Recommended Greenway Network (MPO)	
Facility Type	Mileage*	Facility Type	Mileage*
I	0	I	20
II	46	II	93
III	16	III	110
IV	31	IV	116.5
V	4.5	V	73.5
VI	0	VI	5.5
TOTAL	**97.5**	**TOTAL**	**418.5**
GRAND TOTAL			

**Mileage only a ROUGH estimate because many existing and recommended greenways combine multiple facilities. Further site evaluation is needed to determine exact, proper facility type in recommended network.*

Existing Greenway Network (City of Greensboro)		Recommended Greenway Network (City of Greensboro)	
Facility Type	Mileage*	Facility Type	Mileage*
I	0	I	0
II	34.5	II	23
III	16	III	63.5
IV	26	IV	108
V	4.5	V	57.5
VI	0	VI	0
TOTAL	**81**	**TOTAL**	**252**
GRAND TOTAL			

**Mileage only a ROUGH estimate because many existing and recommended greenways combine multiple facilities. Further site evaluation is needed to determine exact, proper facility type in recommended network.*

Tables 4(a & b). Tables of mileage by facility type (existing and recommended) within the MPO and City of Greensboro.

Type I: No Facility Development (Corridor)

This designation applies to greenway corridors containing environmentally sensitive areas, steep slopes, wetlands, or other constraints that make greenway facility development undesirable or impossible. This type of greenway corridor would remain primarily in a natural state, as human access would be restricted or extremely limited. The functions of this type of greenway corridor may include floodplain management, water quality protection, and conservation of important habitats for plants and wildlife.

Type II: Limited Development (low impact uses)

This designation would apply to corridors containing environmentally sensitive landscapes that limit the extent of facility development. This type of greenway corridor would remain primarily in a natural state, with dirt footpaths (4-6 feet wide) for use by one or two low impact user groups, such as hikers or equestrians. Trailhead facilities and other amenities, such as picnic tables or signage, would be limited.

Figure 4(b). Draper Trail, in Hagan Stone Park, a Type II.

Type III: Multi-use Unpaved Trail

This designation would apply to greenway corridors where the adjacent natural areas, rural landscapes,



or historic sites dictate a more natural facility development objective; where the corridors are located outside areas that are prone to frequent flooding; or where use is anticipated to be recreational and at a lower volume than other areas. The unpaved trails could be surfaced with gravel or crushed stone (10-12 feet wide) and may include boardwalk over environmentally sensitive or saturated areas.

Figure 4(c). Hamilton Lakes Park Trail, a Type III.

This type of trail is designed for several user groups, such as bicyclists, joggers, and equestrians. Wheelchair users and persons with strollers can use unpaved trails if they are designed to ADA standards and surfaced with compacted crushed stone. Trailhead facilities and other amenities, such as benches, signage, and picnic tables, would be developed appropriately.

Type IV: Multi-use Paved Trail

This designation would apply to corridors where high use is anticipated; where greenways do not contain environmentally sensitive landscapes; where corridors will most likely be used as transportation routes; where corridors are located inside areas that are prone to frequent flooding; or where corridors are located within urban areas. The paved trails could be surfaced with asphalt or concrete (10-12 feet wide). Although asphalt is the most common paved surface for trails, concrete is the best material in areas experiencing frequent flooding. This type of greenway corridor is designed for several user groups, such as bicyclists, joggers, and rollerbladers. All multi-use paved trails should be ADA (Americans with Disabilities Act) accessible. Trailhead facilities and other amenities, such as lights, benches, and signage, would be developed appropriately. It should be noted that although a substantial portion of the recommended greenway network is Type IV, a drop to Type III or even Type II may be necessary based on a variety of circumstances (environmental or property-based).

Figure 4(d). NE Community Trail, a Type IV.

Type V: On-road Facilities (sidewalks and bikeways)

This designation applies towards corridors in urban areas where an off-road option is not possible, or corridors which function as connections between off-road trails and major origins and destinations. **On-road greenways would consist of both sidewalks for pedestrian use and bikeways for cyclists when possible.** Bikeways can vary from 6 foot wide bike lanes (complete with pavement striping and signage) to 4 foot wide paved roadway shoulders to a 14 foot wide curb lane (to be shared by cyclists and motorists). Pedestrian scale lighting, street trees, benches, and other amenities could be developed to encourage



sidewalk use. Further evaluation of these corridors by the Greensboro Department of Transportation (GDOT) and City Parks and Recreation will be necessary to determine proper facility type.

Type VI: Paddle Trails

This designation applies to river and stream corridors that can successfully accommodate or have been designated to support low impact, non-motorized water travel, such as canoeing and kayaking. Water-based trails can be designed with appropriate features and facilities, such as inputs, signage, improved rapids, and safety systems, to make water trails more enjoyable.

4.2.3 Description of Recommended Greenway Network

This section provides descriptions of the 100 greenway and trail corridor recommendations throughout the Urban Area. Attention is given to the greenway facility type(s), the geographic location (beginning and ending points), and major opportunities and constraints. The numbers do not indicate ranking, but simply were chosen based on alphabetical order. Prioritization of greenway segments is described in Chapter 7 - Implementation. Maps 4.1 and 4.2 provide a glimpse of these recommended facility types labeled by number.

1. Air Harbor Greenway

The 1-mile, Type III & V Air Harbor Greenway utilizes a drainageway and open space corridor through the North Beech Community common area extending eastward from the Nat Greene Trail to a City-owned water treatment retention pond and the proposed Sweet Gum Trail. The development of this trail requires a sidewalk and/or bikeway along Air Harbor Road to complete the connection. A safe crossing needs to be provided at Lake Brandt Road.

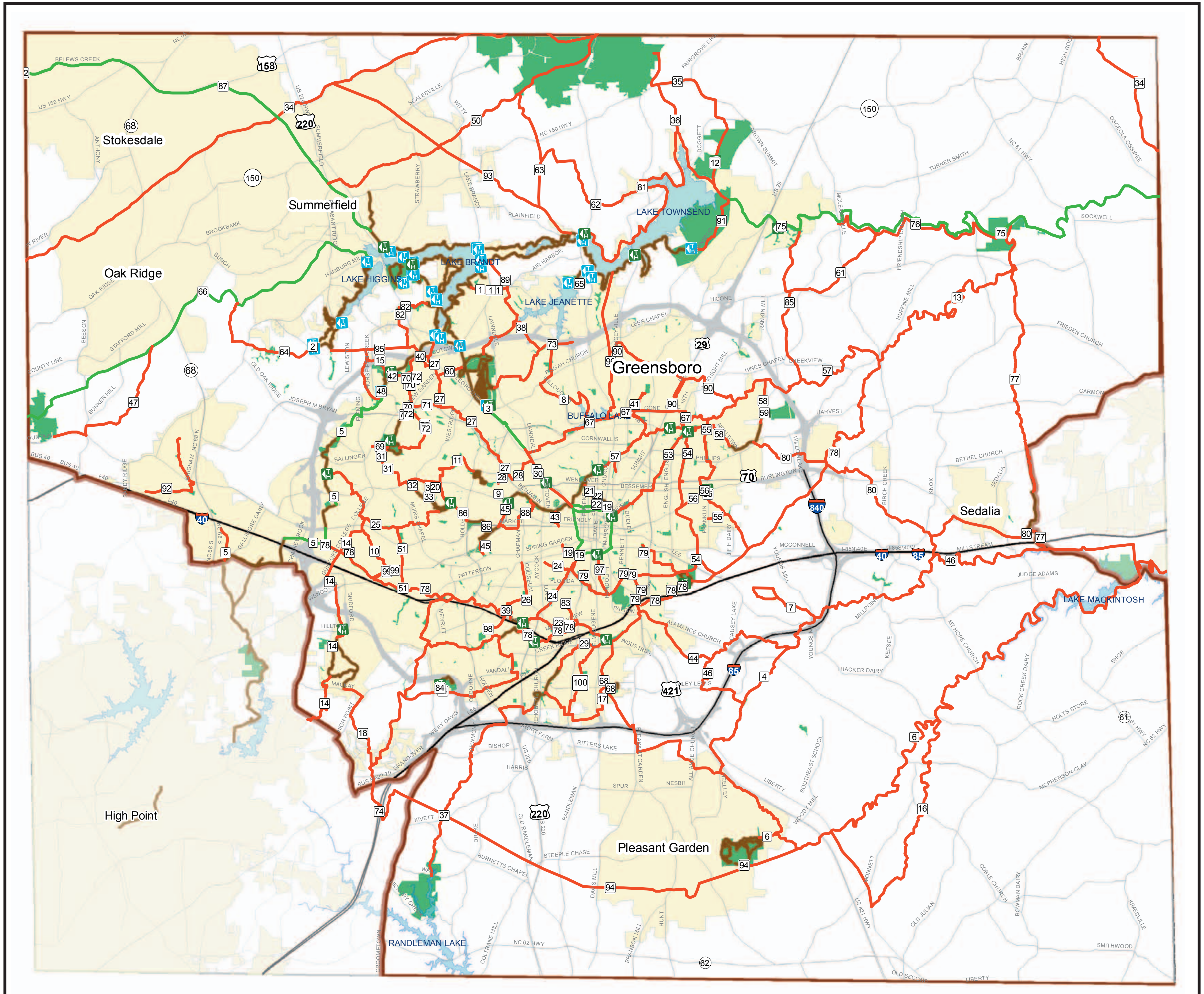
2. Bald Eagle - Beech Bluff Connector Trail

This very short, mostly Type II 0.1-mile trail completes a connection around the southwestern finger of Lake Higgins, connecting the Bald Eagle Trail to the Beech Bluff Trail. It would parallel Brass Eagle Loop, potentially utilizing the road to cross the creek. Further evaluation would be necessary to determine if it would follow the roadway or require a boardwalk or small bridge installation. Other options to discourage motorized vehicle users should be considered here as well due to the relatively heavy illegal use. This is not one of the 2000 bond referendum Connector Routes.

Figure 4(e). The Beech Bluff Trail, shown above, is an excellent resource at the southwestern end of the Watershed region, but does receive illegal motorized/ATV use.

3. Battleground Rail-Trail

The Battleground Rail-Trail is an ongoing effort within the City of Greensboro and is thus part of the comprehensive greenway network. It utilizes a railroad corridor that parallels Battleground Avenue and facilitates off-road transportation and recreation through a very congested area of the City. This vital Type IV greenway link supports multiple uses and provides a strong, north-south spine connecting the Lake Brandt Greenway, Bicentennial Greenway, and Watershed Region with Downtown Greensboro. The proposed Pine Cone Greenway, Green Valley Connector, Downtown Loop Trail, and the existing Lake Daniel Greenway can be accessed via the



Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Map 4.1

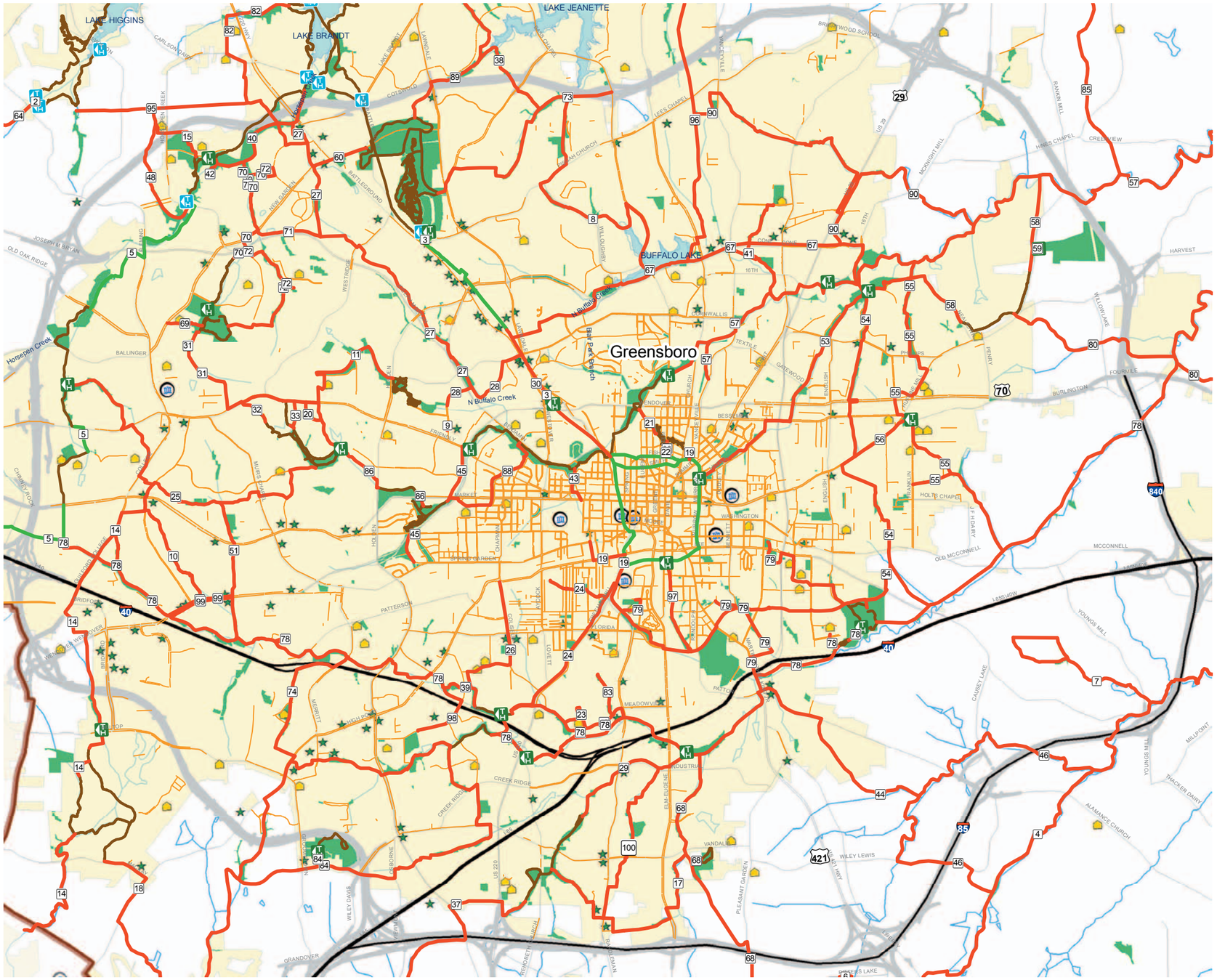
Recommended Greenway Facilities

Legend

- Recommended Trailheads
- Existing Trailhead/Parking
- Proposed Greenways
- Ongoing Efforts
- Existing Off-Road Trails
- Urban Loop
- Interstate
- Major Roads
- Parks
- Incorporated
- Greensboro MAB
- Lakes

1
Miles

Data Source: City of Greensboro



Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Map 4.2

Recommended Greenway Facilities (Inside Urban Loop)

Legend

- Recommended Trailheads
- Trailhead/Parking
- Proposed Greenways
- Ongoing Efforts
- Existing Trails
- Sidewalks
- Colleges
- Schools
- Interstate
- Urban Loop
- Major Roads
- Rivers
- Greensboro MAB
- Lakes
- Parks
- Incorporated

1 Miles

Data Source: City of Greensboro



Battleground Rail Trail once the greenway network has been completed. Because a portion of the railroad line is still active near the downtown, only the northern and middle portions of the corridor can be completed until the southern portion of the line is abandoned.

Figure 4(f). An abandoned railroad corridor presents the perfect topography and provides an ideal space to build a trail, as shown here at Markland Dr., along the planned Battleground Rail Trail corridor.

4. Beaver Creek Greenway

The 3.6-mile Beaver Creek Greenway follows Beaver Creek and its accompanying drainageway and open space buffer. It connects the Little Alamance Creek Greenway with the Big Alamance Creek Greenway through generally undeveloped areas. To reduce the user impact on this creek, a Type II and III greenway facility is recommended for this corridor. It briefly uses a Type V facility to cross US 421 at Neelley Road. Obstacles include creating safe crossing conditions for Alamance Church Road and Liberty Road.

5. Bicentennial Greenway

The 16-mile Bicentennial Greenway is another ongoing effort within the City of Greensboro, City of High Point, and Guilford County and constitutes another key greenway spine. Major sections of the greenway are complete and utilize a combination of off-road Type IV trails and sidewalk facilities in western portions of Greensboro. Ultimately, the completed corridor will connect Greensboro's Watershed Region to High Point Lake, near High Point.

Figure 4(g). An existing section of the Bicentennial Greenway, through the Guilford Courthouse National Military Park.

The existing corridor begins at the planned Battleground Rail Trail, providing access to the historic Guilford Courthouse National Military Park, Nat Greene Trail, Horse Pen Creek Trail, Price Park Extension Greenway, and Carolyn Allen Greenway, and continuing until Horse Pen Creek Road. An uncompleted section between Horse Pen Creek Road and Old Oak Ridge Road will provide access to the McAlister Greenway. Utilizing existing greenspace within the Leonard Center Park and the Carriage Crossing Park, another completed middle section extends from Old Oak Ridge Road to Friendly Avenue. More obstacles exist along an uncompleted portion from Friendly Avenue to Friendway Road. From Friendway Road to Market Street, another completed section provides access to the Friends Greenway, Western Guilford Park, Guilford Primary and Western High Schools. Near High Point, the southern section is complete from Gallimore Dairy Road through the Piedmont Environmental Cen-



ter and Gibson Park, to High Point Lake. The South Buffalo Trail can be accessed from this segment of the greenway. Once environmental and acquisition issues have been resolved, the uncompleted segments of this trail can be completed.

6. Big Alamance Creek Greenway

The 22-mile Big Alamance Creek Greenway traverses the scenic countryside from Pleasant Garden eastward to Guilford Mackintosh Park. The majority Type II trail also provides a spur to Hagan Stone Park and access to the Pleasant Garden Greenway. It would occur as a Type V in a few locations, including along Ritter Lake Road from the Pleasant Garden Greenway, until it approaches the drainageway and open space corridor. It follows the drainageway and open space corridor for a majority of this trail's proposed alignment. A major obstacle for this trail is crossing US 421. Other roadway crossings, such as Alamance Church Road, will also need to be addressed. Wetlands and other environmental obstacles may also be associated with this proposed alignment.

7. Big Dipper Greenway

A branch off of the Little Alamance Creek Greenway, the 2.6-mile Big Dipper Greenway utilizes a drainageway and open space buffer to provide trail opportunities to residential areas between East Lee Street and Youngs Mill Road, just south of I-40. It provides a connection out to the lengthy Little Alamance Creek Greenway. This trail is mostly unpaved, Type II but contains a short stretch of Type V, proposed sidewalk, along Sharpe Road. Safe roadway crossings, such as across Youngs Mill Road, will be needed.

8. Birds Nest Greenway

The 3.6-mile Birds Nest Greenway is part of a network of proposed trails in the north central portions of Greensboro. A paved off-road and on-road combination trail, moving largely through residential areas, it ultimately connects the Redbud Greenway with the Pine Cone Greenway. It travels through Pisgah Church Park and then utilizes existing sidewalk along Pisgah Church Road. As a Type IV facility, the trail uses City-owned greenspace to connect with Tiffany Park and Carolina Laurel Park. It then follows a drainageway and open space corridor through a multi-family housing common area until Elm Street, where it crosses Buffalo Lake, utilizing existing sidewalk. This trail follows Elm Street until it terminates at the Pine Cone Greenway, at Cone Boulevard. Because of the large number of single-family residential parcels within this proposed corridor, the alignment of this trail through the neighborhoods will need to be flexible, as easement acquisition issues may arise. This trail is also in need of safe roadway crossings, particularly at Pisgah Church Road and across other smaller neighborhood streets.

9. Bog Garden Connector

This short 0.05-mile Type V 2000 bond referendum Connector route fills a gap in Type V facilities that connects Bog Gardens to Wesley Long Hospital and Lake Daniel Greenway area. Signage should also be provided directing users to/from the Bicentennial Gardens, Bog Gardens, and Lake Daniel Greenway.

10. Brandywine Greenway

The 1.6-mile Brandywine Greenway runs north-south from the proposed Friends Greenway at Dolley Madison Road to the proposed Wendover Greenway. This trail is proposed to be a Type V at the north end along Dolley Madison Road and Meadowood Street and would become a Type IV along the drainageway and open space buffer that separates residential townhomes from industrial and auto lots. It provides a connection from residential neighborhoods to Wendover businesses. While the space is available throughout most of this corridor, there are locations where space is limited and easements will need to be negotiated along both sides of the proposed trail alignment. Because of



the vast amount of hardscape (parking lots) this trail crosses, the final alignment and design should attempt to provide the most aesthetic route and improve visual and audible qualities for the user, such as vegetative screening, to buffer the adjacent land uses and their associated noise.

Figure 4(h). Cleared open space behind Brandy subdivision off Meadowood Street.

11. Brown Bark Greenway

This 2.3-mile Type IV and V trail represents an important connection in northwestern Greensboro that helps connect the Bicentennial Gardens with the Hamilton Lakes Trail system. It crosses Holden Road just west of Bicentennial Gardens and runs through a considerable amount of City-owned open space and linear parks, including Green Valley Park, Westminster Park, Forest Hill Park, and Brown Bark Park. A crossing at Friendly Avenue is needed. This proposed alignment would require sidewalk and/or a bikeway along Kemp Road until meeting with the Hamilton Lakes Trail.

12. Bryan Park Greenway

The Bryan Park Greenway, a Type III facility, serves as a connector from the northern section of Bryan Park to the Townsend Trail Extension. The natural-surfaced trail would provide an important connection to complete a continuous loop around the entire Watershed system. It would also provide a recreational opportunity and access to Bryan Park facilities for the nearby growing populations. The dam, surrounding wetlands, and railroad all provide legitimate obstacles and the specific alignment would require more extensive research. The specific alignment of this trail should be developed with respect to the footpaths that already exist on the property and also in conjunction with the development of a Master Plan for Bryan Park.

Figure 4(i). City-owned open spaces, such as Brown Bark Park, provide ideal corridors for greenways.

Figure 4(j). Wetlands at Bryan Park provide an obstacle for trail development.



13. Buffalo Creek Greenway

The 8.5-mile, Type III Buffalo Creek Greenway begins at the confluence of the North Buffalo and South Buffalo Creek and terminates at the Reedy Fork Creek Greenway in Northeast Park. The natural-surfaced trail provides a continuous connection from the proposed Greensboro greenways of North Buffalo and South Buffalo Creek towards the northeast portions of the County, completing an important spine of the overall greenway network. Like the North Buffalo and South Buffalo Creek Greenways, this greenway follows the path of Buffalo Creek and may require boardwalk in swampy areas. Depending on future development in eastern Guilford County, easements may be necessary to complete this greenway. Further investigation of this corridor needs to occur to determine the exact trail alignment and to ensure that the design imposes the lowest impact possible on the Buffalo Creek Watershed. Presently, efforts should be made to preserve and protect the Buffalo Creek from future developmental impacts.

14. Bull Run Creek Greenway

A combination of Type III, IV, and V facilities, the 5.5-mile Bull Run Creek Greenway runs north-south in southwest Greensboro, connecting the proposed Brandywine Greenway and the South Buffalo Creek Greenway to Jamestown. Starting at the proposed Brandywine Greenway at Meadowood Street, it crosses the proposed South Buffalo Creek Greenway, I-40, and Wendover Avenue. It then enters the Adams Farm subdivision trails system and follows Bull Run Creek until it leaves the study area at Jamestown. It utilizes the Guilford College Road sidewalk from its north terminus until it crosses I-40. South of Wendover Avenue, it follows a drainageway and open space buffer until it reaches Adams Farm. It follows the trail system on the west side of the subdivision, enters City-owned Kildare Woods open space and follows Bull Run Creek to Jamestown. Overall, the trail provides linkages to residential areas and numerous commercial areas as well. Safe crossings would be required at Wendover Avenue and Hilltop Road. The future Urban Loop/I-840 is a major obstacle that may require a creative design solution/coordination to complete this trail corridor.

15. Carolyn Allen Greenway

The Carolyn Allen Greenway is a short, 0.75-mile route in northwestern Greensboro that will generally serve as a trail within Carolyn Allen Park, but incorporates off-road connectivity between Kernodle Middle School and Caldwell Academy. As a Type III Trail, it could serve as a safe, educational walkway to transport students and also continue off-road access from the numerous surrounding neighborhoods to the park and schools. It also provides a connection between the Bicentennial Greenway and the proposed McAlister Greenway. A safe crossing is needed across Horse Pen Creek Road. The future Urban Loop/I-840 is a major obstacle that requires a creative design solution/coordination to complete this trail corridor.

16. Climax Creek Greenway

Located in southeastern Guilford County, the 6.7-mile Type II Climax Creek Greenway follows Climax Creek, south, from the Big Alamance Creek Greenway. In order to complete a loop back to the Big Alamance Creek, this trail cuts back to the north as a sidewalk/bikeway along Liberty Road, parallel to US 421. Further investigation of this corridor is needed to determine the exact alignment and overcome any environmental obstacles, such as wetlands. Roadway crossings, such as Alamance Church Road, will need safe crossing treatments.

17. Cotton Greenway

The 2.8-mile, Type IV & V Cotton Greenway provides an important connection in the extreme southern central portion of Greensboro from the Shannon Greenway, through residential and commercial sites, eastward,



to its terminus at the proposed Pleasant Garden Greenway. It traverses City-owned open space that extends eastward from the Shannon Greenway. This corridor then connects patchy open space segments with sidewalk segments to provide both on-road and off-road trail facilities. Connection to the commercial area along Randleman Road is also provided. It crosses Randleman and South Elm/Eugene, making adequate crosswalks necessary for safe travel. Negotiations with homeowners will also be necessary to continue the trail between the patchy City-owned open spaces and maintain the trail's predominantly Type IV off-road status.

18. Dogwood Greenway

The 2.6-mile Dogwood Greenway runs north-south, connecting Adams Farm with the proposed Reddicks Creek Greenway, in southwestern Greensboro. It requires Type V sidewalk/bikeway facilities along Mackay Road and High Point Road before it breaks off as a Type IV along a drainageway/open space buffer meandering through residential areas. Nearing its terminus at the Reddicks Creek Greenway, a Type III facility should be in place where the surrounding population is less dense. Safe roadway crossings at the intersecting railroad and at High Point Road are needed to maintain this trail's connectivity.

19. Downtown Loop Trail

The approximately 4-mile Downtown Loop Trail is an ongoing effort in the City of Greensboro and represents a key center point to the overall trails network. It is a 10-year project, looping around the central core of Downtown, linking public space with facilities, neighborhoods, and commercial centers. Many significant existing and proposed trail systems connect into the future Downtown Loop Trail and radiate away in all directions, including the existing Latham Park Greenway, the planned Battleground Rail Trail, and the proposed Fisher Park Trail Extension #2, Freeman Mill Greenway, Vance Arlington Greenway, and the Muddy Creek Greenway. It creates a loop utilizing Fisher Avenue, a railroad corridor, Bragg Street, and Murrow Boulevard.

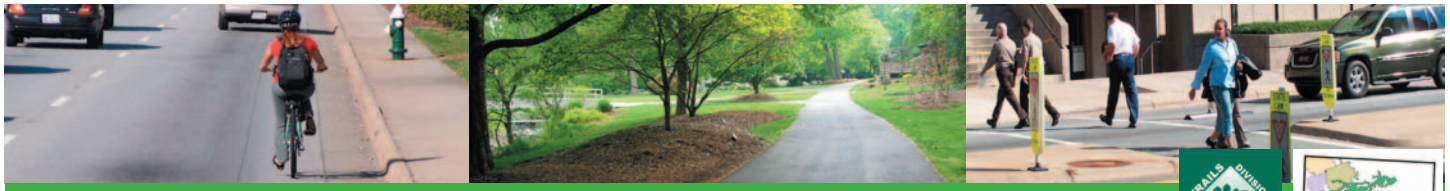
Figure 4(k). A worn footpath, shown here off of Lee Street, supports the need for a trail facility between Lee Street and Dorothy Brown Park. This corridor is proposed as part of the Downtown Loop Trail.

19a. Downtown Loop Spur: Taking advantage of an existing pedestrian underpass at Murrow Boulevard and Summit Avenue, this spur connects the Downtown Loop Trail to older established neighborhoods north of the downtown center.

Figure 4(l). An underutilized, existing underpass under Murrow Blvd.

20. Erskine Greenway

Located southeast of Guilford College in western Greensboro, the short Type III Erskine Greenway is a 0.3-mile branch trail connecting the proposed Guilford



Greenway to the Brown Bark Greenway. It utilizes City-owned open space and would exist as a sidewalk/bikeway for a very short distance along Erskine Drive until it meets with the Guilford Greenway at Friendly Avenue.

21. Fisher Park Trail Extension #1

In central Greensboro, this short extension northward from the Fisher Park trail system connects to the Latham Park Greenway using existing sidewalk (Type V facilities) along Fisher Park Circle and Parkway Avenue. Improved trail signage and safe crosswalks along this route would improve awareness and facilitate better access of the trail facilities and nearby attractions.

22. Fisher Park Trail Extension #2

This extremely short extension connects the Downtown Loop Trail, in central Greensboro, to Fisher Park. This trail utilizes existing sidewalk (Type V facilities) along the east and west side of Elm Street. The addition of trail signage and enhanced pedestrian crossings will help usher people to/from the Downtown area.

23. Foust Loop Greenway

The half mile Foust Loop Greenway extends from the proposed Meadowview Greenway, along the edge of the Foust Elementary School grounds, across Floyd Street, around Kersey Park, and southward to again connect with the Meadowview Greenway. This mostly Type IV corridor utilizes City-owned, neighborhood, and linear open spaces, and existing sidewalk along Floyd Street to provide a connection between the neighborhoods, school, and trail system in southern Greensboro. This trail needs a safe crossing at Meadowview Road.

24. Freeman Mill Greenway

The 2-mile Freeman Mill Greenway follows the open space easement along the west side of Freeman Mill Road from Whittington Street and the proposed SE Connector Greenway, southward, to Meadowview Road and the Hillsdale Greenway. Because it follows roadway, it is mostly a Type V facility but is unique because of the wide roadway easement buffer through the majority of the corridor. It provides a key linkage from the Downtown Loop Trail area to the South Buffalo Creek Greenway and to areas south of I-40. It utilizes some existing sidewalk along Freeman Mill Road that can be expanded to host more users. It would connect many residents in the neighborhoods off of Meadowview Road to Downtown. This trail must have adequate roadway crossings at Freeman Mill Road/Whittington Street, Florida Street, and Coliseum Boulevard, as well as smaller neighborhood streets.

Figure 4(m). Negotiating an easement through a common area of a multi-family residential development provides an ideal connection for Greensboro's trail network, as well as an added ammenity and selling feature for the development. Here, both pictures show the Bicentennial Greenway passing along Kensington Place Apartments.

25. Friends Greenway

The 4.4-mile Friends Greenway forms another important proposed network spine running west-east from the Bicentennial Greenway to the Hamilton Lakes Park trail system in northwestern Greensboro. It traverses a mix of land uses, mostly residential. Proposed as a mix of Type III, IV, and V facilities, the Friends Greenway utilizes City-owned open space near the Bicentennial Greenway, drainageway/open space buffer patches, and existing sidewalk. It skirts the edge of Friends Homes Retirement Community, providing walking options there. It also runs through Guilford



Middle School and Morehead Elementary School and a significant number of apartment/townhome common open spaces. Negotiations with homeowners and multi-family developments will be necessary in many locations. Significant roadway crossings, such as Friendly Avenue, College Road, and Muirs Chapel Road will need safe crossing solutions.

26. Glenwood-Coliseum Greenway

This 1.6-mile, Type IV and V greenway connects the Coliseum and Glenwood Recreation Center southward to the recommended S. Buffalo Creek Greenway at Hillsdale Park. It follows existing sidewalk south along Coliseum Boulevard. At Ontario Street, it cuts west using sidewalk, connecting to Jackson Middle School. At a linear City-owned open space extension of Hillsdale Park, the greenway connects to the S. Buffalo Creek Greenway as a brief Type IV facility.

27. Gracewood Greenway

The 4.1-mile Gracewood Greenway runs north-south as a Type IV and V facility, mostly along easement on the east side of Bryan Boulevard. It begins at the recommended Green Valley Connector at Pembroke Road and the Green Valley Office Park. The proposed greenway alignment turns northward, paralleling Benjamin Parkway, cutting through Guilford Hills Park. This trail utilizes city-owned greenspace along a drainageway and open space corridor, which crosses numerous neighborhood streets, significantly, Cornwallis Drive and Fernwood Drive. The greenspace narrows out where Benjamin Parkway spurs to the east, creating the need for an innovative, safe crossing via a triangular shaped island between the exit roadways of Benjamin Parkway. This trail follows a wooded greenspace corridor, nearly 150' at its widest, which runs parallel between Bryan Boulevard and Gracewood Drive, crossing Holden and continuing north. The trail then runs away from Bryan Boulevard to Westridge Road where large land parcels may present an obstacle in this trail's development and future public access. A drainageway and open space corridor is utilized through the British Woods and Friendly Acres North neighborhoods and across New Garden Road to the Brassfield Shopping Center. Its north terminus is the proposed Horsepen Creek Greenway, which connects to the Bicentennial Greenway. The New Garden Greenway, which spurs off the Gracewood Greenway, provides service to the Guilford Courthouse National Military Park. Besides the numerous roadway crossings, this trail alignment has few obstacles and would provide a strong off-road, north-south connection in west-central Greensboro.

Figure 4(n). Just south of Guilford Hills Park, a footpath runs through a drainageway and open space corridor towards the Green Valley Office Park. The Gracewood Greenway would utilize this corridor as a Type IV greenway facility.

Figure 4(o). The proposed greenway network provides access to many neighborhood parks, including the Guilford Hills Park, shown here. Access from the Gracewood Greenway would be provided at Cornwallis Drive.



28. Green Valley Connector

The 1.3-mile, Type IV & V Green Valley Connector, in west-central Greensboro utilizes off-road and on-road facilities to connect multiple uses and proposed greenways. It extends from the east end of the Bog Gardens at Starmount Farms Drive along Pembroke Road, crossing Benjamin Parkway eastward through Green Valley Office Park open space, and then along Cornwallis Drive to meet with the Battleground Rail-Trail. A safe crossing treatment is recommended at Benjamin Parkway. A safe crossing is also recommended for Battleground Avenue to access the Battleground Rail-Trail. This proposed alignment provides a connection towards the Friendly Center Shopping area from the Battleground Avenue commercial corridor. This is one of the 2000 bond referendum, City-proposed Connector Routes.

29. Greenhaven Greenway Trail Extension

This extension of the Type IV Greenhaven Greenway travels 1.6 miles northward along Ryan Creek until it meets the proposed South Buffalo Creek Greenway. Beginning at Mystic Drive, this corridor follows a drainageway/open space buffer through City-owned parkland and between parcel boundaries through a mix of residential, commercial, and industrial sites. This trail meanders through the Yorktowne Apartment complex. A kudzu patch will provide an obstacle during construction as the trail nears existing City-owned parkland. This trail provides access to the South Park Plaza, east of Randleman Road. A safe crossing at Randleman Road will be necessary. Next, the trail corridor travels through a predominantly industrial landscape after it crosses Creek Ridge Road. The underpasses at Creek Ridge Road and Elm/Eugene Street can be used as safe, off-road crossing options. The trail then merges with the South Buffalo Creek Greenway.

Figure 4(p). Existing portion of the Greenhaven Greenway.

30. Grimsley Connector

This very short 0.05-mile Type V Connector Route greenway extends existing Grimsley Connector sidewalk northward along Westover across Green Valley. It crosses Westover on the north side of Green Valley extending to the Battleground Rail-Trail. Safety intersection crossing improvements are recommended to help aid flow and safe connectivity to the Rail-Trail from Westover Tr. This is one of the 2000 bond referendum, City-proposed Connector Routes.

31. Guilford Greenway

The 2.2-mile, Type IV & V Guilford Greenway in northwestern Greensboro, connects the Price Park trail system through Guilford College, to Friendly Avenue, the Hamilton Lakes Park trail system, and the proposed Brown Bark Greenway along Kemp Road. Plentiful, wooded open space exists south of Price Park, starting with Robin Ridge Park, through Guilford College and the trail would utilize sidewalk along Friendly Avenue to connect into the Hamilton Lakes trail system. Negotiations, education, and other efforts with Guilford College will be necessary, as the College has voiced liability concerns in the past.

31A. Guilford Spur. This short spur cuts westward through Robin Ridge Park to Belvidere Place and the Robin Ridge neighborhood.



32. Hamilton Lakes Trail Extension #1
This short extension trail extends the western finger trail northward along a drainageway/open space buffer through residential areas to the proposed Guilford Greenway and to Friendly Avenue. Negotiations with homeowners will be necessary to develop this as an off-road Type III trail in northwestern Greensboro.

33. Hamilton Lakes Trail Extension #2
This short Type III extension trail in northwestern Greensboro extends the eastern finger trail to Friendly Avenue. While a parallel trail of the Hamilton Lakes Trail system already exists just to the west, this linear, City-owned open space still provides a nice recreational opportunity. It also serves to officially connect the short gap between the Hamilton Lakes Trail and the Hamilton Lakes NW Trail.

34. Haw River Greenway
The proposed Type I & II Haw River Greenway begins at the headwaters of the Haw River in Northwest Guilford County and continues northeastward to the Rockingham County line. A small section of river re-enters Guilford County in the extreme northeast, leaving again at the Alamance County boundary, creating an opportunity for just over 20 miles of trail (both Guilford County segments). The trail would be generally natural, providing low impact recreational opportunities along the scenic river. In order to implement this trail, the corridor must follow the drainageway and open space easement along the southern side of the river, due to user restriction from industrial operations on the northern side. Developers and landowners in the communities of Oak Ridge and Summerfield are supporting the concept and developing trails as part of their developments. Collaborative efforts between Summerfield, Stokesdale, Oak Ridge, Guilford County, and even surrounding counties (especially Rockingham) will be necessary to continue the piece-by-piece development of this scenic trail. The City can require greenway dedications within new subdivisions to provide access and help to facilitate the creation of this trail. Existing underpasses may be utilized to combat crossing obstacles and boardwalks may be needed to lessen the impact on wetlands. Further investigation is necessary to determine which portions should be Type I and Type II based on environmental constraints.

35. Haw River State Park Summit Trail
The Haw River State Park Summit Trail connects two future significant parkland areas, Bryan Park at Guilford County and the Summit at the Haw River State Park as a Type II and V facility. Only 3 miles separates the two parks and this greenway would be a great feature of both. It extends from the Summit at Haw River State Park along Spearman Road southward to the trail system of Bryan Park generally following Spearman Road, NC 150, and Clayton Road. Every effort should be made to develop this as an off-road facility and easement acquisition will be necessary through this generally undeveloped land. Further study will be required to determine the exact alignment.


Figure 4(q). Summit at Haw River State Park.



36. Haw River State Park Summit Trail #2
This Type II and V trail provides another means to connect the Watershed region with the Haw River State Park. It extends southward from the recommended Haw River State Park Summit Trail at NC 150 and the State Park to the recommended Skipping Rocks Trail at a north side finger of Lake Townsend. It would parallel Bee Jay Road but again, further study will be required along with easement acquisition to provide this unique off-road connection.

37. Hickory Creek Greenway
The 6.3-mile Hickory Creek Greenway in southern Greensboro runs from the Shannon Greenway southward to Southwest Park in Guilford County. It follows Hickory Creek and the corresponding drainageway and open space buffer, through a predominantly rural landscape. Obstacles include establishing a sidewalk/bikeway along Holden Road to cross I-85, just south of the Shannon Greenway. The northernmost sections of this trail, where a larger population is served, will be a combination of Type IV and V. Unpaved trail sections, Type III, are recommended in the rural areas.

38. Hickory Greenway
Hickory Greenway runs just over one mile and is a Type IV facility. It is part of the proposed trail network, weaving throughout the residential areas in north-central Greensboro. It utilizes linear open space corridors, mostly City-owned, to connect the proposed Sweetgum Greenway at Lake Jeanette, to the Redbud Greenway. Coordination to cross the Outer Loop will be an obstacle.

39. Hillsdale Connector
This 0.6-mile Type IV and V greenway connects the existing Hillsdale Greenway at Meadowview Rd. and Hardie St., following the north side of the S. Buffalo Creek, through Hillsdale Park. Part of the recommended overall S. Buffalo Creek Greenway, it is completely contained within Hillsdale Park. It ends to the west back at Meadowview Rd. near its intersection with Murrayhill Rd and at the recommended Vanstory Connector. The S. Buffalo Creek Greenway continues westward. It crosses Meadowview Rd. and Vanstory Rd. where safe mid-block crossings would be necessary. A portion of this greenway includes one of the 2000 bond referendum Connector Routes.

40. Horsepen Creek Greenway
Located in northwestern Greensboro, just south of the Watershed Region, the 1.3-mile, Type III Horsepen Creek Greenway follows the Horse Pen Creek and connects the proposed Price Park Extension Greenway to the Bicentennial Greenway. Beginning at the Price Park Extension Greenway, it utilizes park and open space and mostly runs parallel to the existing northern section of the Bicentennial Greenway, on the south side of Horse Pen Creek until Battleground Avenue. This trail is bisected by the proposed Sleepy Hollow Greenway at Camden Falls Park. A Type V facility along Battleground Avenue connects the trail to the north side of Horse Pen Creek, where it again follows the Horse Pen Creek corridor to intersect the Bicentennial Greenway. Obstacles include crossing Battleground Avenue near the Capsule Group Retail Shops.

41. Joe Davis Greenway
This 1.3-mile, Type IV & V trail runs north-south from Rankin Elementary School, through O'Henry Oaks linear park, across Cone Boulevard, through Joe Davis Park, and finally to Cone Mills Industrial Park and the proposed North Buffalo Creek Greenway. It crosses the proposed Pine Cone Greenway along Cone Boulevard which provides access to numerous commercial destinations, linking together the neighborhoods on either side of Cone Boulevard. It follows drainageway and open space buffers, traverses City-owned parkland, utilizes existing fitness footpaths, a utility corridor, and

open space around Joe Davis Park and south of 16th Street. Safe crossings would be necessary at Cone Boulevard and 16th Street.

Figure 4(r). The proposed Joe Davis Greenway passes through several stretches of open spaces, here south of 16th Street.

42. Kernodle Connector

This short 0.2-mile, Type IV, Connector Route greenway connects the recommended Price Park Extension Greenway southward from near Horse Pen Creek to the Saddlecreek neighborhood and Terrault Drive through Saddlecreek City-owned parkland and open space. This is not one of the 2000 bond referendum, City-proposed Connector Routes.

43. Lake Daniel Greenway - UNC-G Spur

This short Type IV & V, 0.4-mile greenway connects the Lake Daniel Greenway southward to the UNC-Greensboro campus along Lake Daniel complex parkland, parallel to East Lake Drive. A signalized crossing exists at Market Street but a safer crossing would need to be provided across Friendly Avenue.

44. Liberty Valley Greenway

The 17.7-mile, mostly Type II & III Liberty Valley Greenway runs northwest-southeast in extreme southeastern Greensboro, connecting the proposed South Buffalo Creek Greenway with the Little Alamance Creek Greenway. It requires a Type V facility along Alamance Church Road to create the western section of trail, but follows off-road drainageway and open space buffer areas until meeting the Little Alamance Creek. It provides access to Alamance Square and Alamance Crossing just off the South Buffalo Creek. To the east, the trail runs through a mixture of forest and farmland where easement acquisition will be necessary along the buffer.

45. Lindley Park Connector

This 2000 Bond referendum Connector Route greenway can be divided into two segments split by existing trails in the Arboretum. South from the Arboretum, a 0.4-mile segment is mostly a Type IV facility with a brief portion of Type V, running north to south. It utilizes Lindley Center Park, paralleling the east side of Wendover. At Walker Ave., and to the north, the trail becomes Type V, turning to the east to cross Walker Ave. at Lindell Road. It provides a linkage between the Lindley Center and additional Lindley Complex Park to the east along Lindell Road. It also links to existing connector sidewalk that crosses Wendover to the Arboretum.

To the north of the Arboretum, the second segment provides a direct means to connect the western end of the Lake Daniel Greenway to the Friendly Center and the Arboretum trail system. A Type V facility, it follows existing sidewalk westward along Friendly at the end of the Lake Daniel Greenway, across Wendover to the Friendly Center. It crosses Friendly southward at the Green Valley Road intersection, follows Green Valley Road sidewalk southward, crossing Market Street to the ballfields at Market Street Park and the Arboretum trail system. Safe crossings would be necessary at Wendover, Friendly, and Market. Although utilizing existing sidewalk, the corridor should add trail signage



directing users to/from the Lake Daniel Greenway and Arboretum and add width to the sidewalk where possible to allow for more use. The addition of bikeway facilities should also be considered.


Figure 4(s). Connecting the west end of the Lake Daniel Greenway with the Arboretum trail system would link two heavily used park areas.

46. Little Alamance Creek Greenway

The Little Alamance Creek Greenway begins at the proposed Beaver Creek Greenway in southern Greensboro and runs east 17.7 miles to Guilford Mackintosh Park and the Big Alamance Creek Greenway in eastern Guilford County. This trail is a combination of Type II and III and would generally be a recreational corridor, utilizing drainageway and open space buffers along the Little Alamance Creek Greenway. It crosses I-85/future Urban Loop four times with very adequate, dry underpass space and potential options for the trail.

47. Longview Greenway

The 4.1-mile Type III Longview Greenway runs off the Piedmont Greenway west of the Piedmont Triad International Airport, in western Guilford County, providing an alternative means to access Triad Park. This trail travels through predominantly forested landscape and provides a connection to the proposed PTI Greenway. It follows the drainageway and open space buffer and would require Type V facilities along Bunker Hill Road and Market Street at the western end, nearing Triad Park.

48. McAlister Greenway

In extreme northwestern Greensboro, the 1.7-mile McAlister Greenway runs north-south from the proposed Utility Line Greenway #3 to the Bicentennial Greenway. In the north, it provides access to Caldwell Academy, follows a forested drainageway and enters a long stretch of linear City-owned parkland. It briefly follows Horsepen Creek to the east until its terminus at the Bicentennial Greenway. The future Urban Loop/I-840 is a major obstacle that requires a creative design solution/coordination to complete this trail corridor. Easement acquisition may be necessary in the northern half of this recommended Type III trail.

49. Meadowview Greenway

The 1.6-mile Meadowview Greenway is mostly a Type V recommended facility providing service to a generally underserved and highly populated residential area. It takes advantage of existing sidewalk on the south side of Meadowview Road between the Hillsdale Greenway in the Freeman Mill Road area to Randleman Road. The sidewalk should be widened to at least 10 feet to facilitate multi-use and two-way traffic. This can be done by taking advantage of the open space, extending away from Meadowview Road to the south. Several proposed short trails, such as the Southern Hospitality Greenway and Foust Loop Greenway, tie into this spine and provide connections to linear City-owned open space and schools.

49a. Meadowview Spur: The first proposed spur runs south to the proposed South Buffalo Creek Greenway, taking advantage of a cleared sewer easement.

49b. Meadowview Spur: The second proposed spur runs down the backside of the Spring Valley Shopping Center to the South Buffalo Creek Greenway.



50. Mears Fork Creek Greenway

The 8.5-mile, mostly Type II Mears Fork Creek Greenway begins at Summerfield Road and the proposed Summerfield-Stokesdale Rail Trail, near the Summerfield Elementary School, and follows Mears Fork Creek through a predominantly rural landscape. This trail ends at the Haw River near the Rockingham County line. This would be a natural surfaced, recreational trail that could provide opportunity for equestrian usage as well. Obstacles include roadway crossings at US 220 and Lake Brandt Road and possible wetlands within the creek's floodplain. This trail would connect the future Haw River State Park with Summerfield. The Guilford County Open Space Committee is currently working to acquire land in this corridor.

51. Mitchell Greenway

In western Greensboro, the 1.5-mile Type IV Mitchell Greenway runs north-south from the proposed Friends Greenway to the proposed South Buffalo Creek Greenway. It provides service to Mitchell Park, Guilford Mills Industrial Park, Friendship Industrial Park, Wendover Avenue, and Wendover Industrial Park. The trail follows a drainageway and open space buffer that traverses multiple land uses. Obstacles include sections of industry and impervious surface, along with crossings of Market Street, an active railroad, and Wendover Avenue.

52. MST Trail

The MST Trail will run east-west through the northern part of Guilford County. The location and alignment of the trail is still being determined with possible alignments along sections of east-west roadways, the Summerfield abandoned rail-trail corridor, Watershed trails, Haw River, and Reedy Fork. The MST Piedmont Planning Team, consisting of local, regional, and State officials, is working to determine more precise locations for the trail. One of the goals of the MST effort is to keep this long distance trail off-road when possible. Discussions about the need for a direct route versus comfortable route versus the scenic route continue. It is recommended here that the MST Trail utilize the recommended Reedy Fork Creek Greenway (#69), the existing Watershed Region trails, and the recommended Summerfield-Stokesdale Rail-Trail (#81) to achieve these off-road goals. Potentially, all bases are covered when following the stream corridors, Watershed lakes, and abandoned rail corridor because the corridor is mostly flat, scenic, and direct. Spurs connecting to future state parks (Haw River State Park and Summit at Haw River State Park) to the north should be and are being considered as well because of the facilities available.

53. Muddy Creek Greenway

The Muddy Creek Greenway begins at the North Buffalo Creek Greenway and ends at the future Downtown Loop Trail. Running for 3 miles, this corridor is a combination of Type IV and V facilities following Muddy Creek, providing transportation and recreation to underserved residential areas in eastern Greensboro and connectivity into the NC A&T campus and Downtown. This greenway begins at the proposed North Buffalo Creek Greenway, near White Street, cutting through Bywood Park to Woodmere Park.

Figure 4(t). Light posts along proposed Muddy Creek Greenway alignment near NCA&T.

The greenway takes advantage of existing sidewalk along Sharonbrook Drive, which runs along linear Woodmere Park. Muddy Creek Greenway crosses Phillips Avenue near the Greensboro Presbyterian



Church, where a crosswalk is necessary. This proposed alignment continues south through Autumn Park and crosses Textile Drive, where another crosswalk is needed. From here, the corridor travels along the west side of Muddy Creek, through Carolina Heights Park. It follows a sewer easement through Gatewood Park to Wendover Avenue. At Wendover Avenue, a pedestrian overpass would provide ideal conditions for crossing this busy roadway. The trail then faces the obstacle of following the very narrow Muddy Creek corridor, through a dense industrial area, for approximately 0.2 miles, until it reaches Bessemer Avenue. Here, the greenway becomes a Type V facility, utilizing existing sidewalk along Bessemer Avenue, to cross US 29. This on-road facility continues along Lindsay Street, where a crosswalk is necessary, back to the Muddy Creek corridor. It then utilizes patches of open space at NC A&T campus that parallel Lindsay Street into the downtown. The corridor also runs through a wooded area at NC A&T campus where a series of lampposts were discovered.

It travels across War Memorial Stadium property, requiring coordination with the University to reconfigure the existing parking lot and accommodate a Type IV facility. Access to the Farmer's Market is provided from the Muddy Creek Greenway. The greenway becomes a Type V facility, again utilizing existing sidewalk along Lindsay Street and an existing crosswalk at Murrow Boulevard. The greenway terminates at the Downtown Loop Trail. Obstacles include the major road crossings at Wendover Avenue, US 29, and Lindsay Street and the narrow stream buffers between the NC A&T campus and Wendover Avenue.

54. Muddy Creek Greenway #2

The Muddy Creek Greenway #2 parallels the proposed Muddy Creek Greenway to the east and provides an important north-south off-road option through eastern Greensboro. It begins at the proposed Muddy Creek Greenway #3, near White Street, and extends southward almost five miles, ending at the South Buffalo Creek Greenway, just east of Barber Park. The trail begins in Bywood Park following a tributary of Muddy Creek through linear greenspace along Bywood Road utilizing existing sidewalk. After crossing Phillips Avenue, this corridor continues as a Type IV facility, following linear drainageway and open space/sewer easement stretches and City-owner parkland, such as Textile Drive Park and Brook Gardens Park to Wendover Avenue. At Wendover Avenue, a Type V facility is proposed eastward to Waugh Street, where a safe crossing is needed at the intersection.

Figure 4(u). Open space parallel to Waugh Street provides opportunity for an off-road portion.

On the south side of Wendover Avenue, the proposed trail continues to follow a drainageway and open space corridor through the back of single-family lots and along the east side of the Lorillard Tobacco Company property, until it reaches Market Street and the proposed Muddy Creek #2-#3 Connector. Here the proposed trail briefly utilizes existing sidewalk along Market Street to Holts Chapel Road, where it crosses the railroad. From Holts Chapel Road, the trail again utilizes a drainageway and open space corridor/sewer



easement through a mixture of residential and undeveloped land, including Stone Gate Crossing Park. The future Millennium Campus can be accessed from this proposed trail. Obstacles include the crossings at Phillips Avenue, Wendover Avenue, and Market Street. Easement acquisition may be an issue when connections need to be made across industrial, residential, and institutional parcels.

54A. Spur: A proposed spur into the northern end of Barber Park is proposed off of the Muddy Creek Greenway #2.

Figure 4(v). Open space on Lorillard property. An easement from Lorillard would be necessary.

55. Muddy Creek Greenway #3

The 4.3-mile, mostly Type IV & V Muddy Creek Greenway #3 parallels Muddy Creek Greenway #2 to the east. It runs from the proposed North Buffalo Creek Greenway to its terminus at the South Buffalo Creek Greenway. Beginning within a wooded City-owned parcel, this trail begins at the North Buffalo Creek Greenway and crosses White Street into Bywood Park. Within Bywood Park, this trail provides access to the Muddy Creek Greenway #2 to the west and the NE Community Trail Extension to the east. From here, this proposed alignment utilizes City-owned parkland through Kings Forest Park to Phillips Avenue, where a crosswalk is necessary. This trail utilizes existing and proposed sidewalks/bikeways as a Type V facility to connect multiple schools around Wendover Avenue, Huffine Mill Road, and Franklin Boulevard. At the intersection of Naco Road and Franklin Boulevard, the trail again becomes an off-road facility, providing connections to more schools and residential neighborhoods. The trail follows a drainageway and open space corridor through Poplar Ridge Park and undeveloped lands until it meets the South Buffalo Creek Greenway. Easements will need to be acquired along the drainageway and open space corridor and safe crossings at Phillips Avenue and Wendover Avenue will be necessary.

55A. Spur: A spur runs west to Franklin Boulevard, utilizing open space, near the Hope Valley subdivision from the Muddy Creek Greenway #3.

Figure 4(w). Bywood Park, at the north end of all recommended Muddy Creek Greenways, is a great neighborhood trip attractor.

56. Muddy Creek Greenway #2 - #3 Connector

This short connector follows Market Street, utilizing ex-



isting sidewalk to connect Muddy Creek Greenway #2 with Muddy Creek Greenway #3. Improvements with lighting and landscaping would allow this segment to provide a loop opportunity for residents and extend the pedestrian-friendly street design along Market Street into the Downtown. This is not one of the 2000 bond referendum, City-proposed Connector Routes.

57. North Buffalo Creek Greenway

This alignment replaces or becomes an alternate of the older proposed Keeley Park Connector route.

The 10.5-mile North Buffalo Creek Greenway forms one of the key proposed greenway spines in Greensboro and a portion contains a new alternative alignment for a 2000 bond referendum Connector route, the Keeley Park Trail. The majority Type IV trail serves the east and northeast portions of Greensboro connecting residential and commercial sites and utilizing the North Buffalo Creek corridor and its drainageway and open space buffer for its entire length. It runs from the Latham Park Greenway eastward until it merges with the proposed South Buffalo Creek Greenway to form the proposed Buffalo Creek Greenway.

Figure 4(x). Abandoned railroad and railroad bridge at Revolution Mills provide a unique stretch of the N. Buffalo Creek Greenway.

Starting at Elm Street and the east end of the Latham Park Greenway, the corridor starts as a Type V facility along the south side of Tankersley at the hospital. Cutting north along Church St., the corridor crosses Church St. on the north side of the N. Buffalo Creek. East of Church, the Type IV greenway crosses underneath a railroad bridge, cutting into an abandoned rail behind Revolution Mills until it reaches Yanceyville. Crossing Yanceyville, the trail provides access to Revolution Park and cuts through Cone Mills Industrial Park open space along the creek, providing a connection to the proposed Joe Davis Trail. The trail then crosses Summit Avenue to city-owned open space where it cuts north along a sewer easement to 16th St. Using 16th St., the trail crosses US 29 to the former Carolina Circle Mall area as a Type V, where it cuts back to City-owned land on the north side of the N. Buffalo Creek. Paralleling 16th St., the trail remains off-road the duration of its length. The trail meets the proposed Pine Cone Trail and Muddy Creek Trail near the Wastewater Plant. The trail continues east along the northern edge of the Wastewater Plant and landfill along the south side of the N. Buffalo Creek. As the greenway continues eastward, it meets the Muddy Creek Trail #3 and NE Community Trail Extension in a continuation of City-owned land. East of the NE Community Trail Extension, the greenway passes through mostly undeveloped, non City-owned lands as a Type III, meeting the proposed Squirrel Greenway and finally meeting with the proposed S. Buffalo

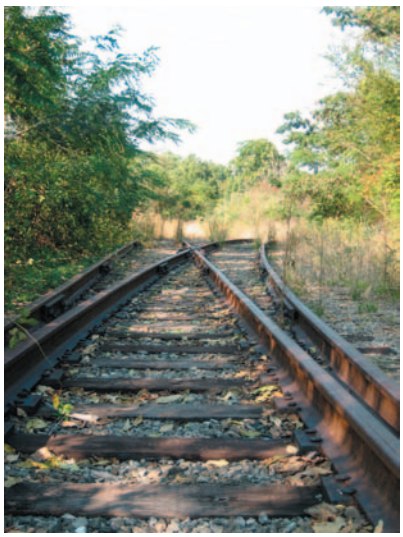


Figure 4(y). Unused railroad near Revolution Mills.



Creek Greenway near Mcleansville Road.

Further study on precise alignment will be necessary along the entire corridor depending on the numerous obstacles (road crossings, environmental obstacles, and ease of acquisition). The crossing of US 29 is possible in a few locations other than 16th (including Phillips Ave., Cone Blvd, and the actual N. Buffalo Creek crossing) and the final crossing location may be more opportunity-based. The future Urban Loop/I-840 is a major obstacle on the trail's eastern side that also requires a creative design solution/coordination to complete this trail corridor.

57A N. Buffalo Greenway Spur
This spur utilizes an abandoned railroad south from the N. Buffalo Creek Greenway and Revolution Mills. It runs behind the Post Office and ends at Proximity Business Park and Yanceyville Street sidewalk.

58. NE Community Trail Extension #1
On the west end of the NE Community Trail, in northeastern Greensboro, this proposed extension would be a Type V facility along Nealtown Road and White Street linking to the proposed Muddy Creek Greenway system. Because of the heavy truck traffic along this route, a buffer between the roadway and the sidewalk/sidepath would be ideal to make this alignment more trail-user-friendly.

59. NE Community Trail Extension #2
On the east end of the NE Community Trail, in northeastern Greensboro, this proposed extension runs due north from near Keeley Park, following the edge of City-owned land (surrounding the landfill) until it meets the proposed North Buffalo Creek Greenway. Easement acquisition will be necessary along a short stretch of the southern end of this segment to complete this Type IV facility.

59A. Spur: A spur connecting to Keeley Park runs eastward off of this trail, requiring a well designed roadway crossing for Rankin Mill Road.

60. New Garden Greenway
This short 0.6-mile trail serves as a Type V connector along New Garden Road to connect the proposed Gracewood Greenway to the Guilford Courthouse National Military Park. This trail crosses Battleground Avenue and runs through Tannenbaum Park before reaching the Guilford Courthouse National Military Park Trail system. It provides service for users to residential, commercial, and park land areas.

61. Northeast School Greenway
In northeastern Guilford County, the Type II Northeast School Greenway follows drainageway and open space buffers through mostly undeveloped lands, connecting the proposed Squirrel Greenway and MST Trail to the proposed Reedy Fork Creek Greenway. It provides service to both the Northeast Middle School and Northeast High School. Safe crossings would be necessary at Hines Chapel Road and McLeansville Road.

62. Northern School Greenway
This 3.8-mile greenway provides access from the future Northern High & Middle School south and eastward to the proposed Skipping Rocks Trail in the Watershed region. It begins as a Type V facility leaving the school along Simpson-Calhoun Road and briefly on Spencer-Dixon Road. It cuts eastward on Grenham Road until it reaches Squirrel Creek and its associated drainageway and open space buffer. It follows the creek to the Watershed lakes as a Type III facility where it meets the proposed Skipping Rocks Trail near Yanceyville Road.

63. Northern School Greenway #2
This 3-mile greenway runs from the future Haw River State Park and the proposed Mears Fork Greenway



southward to the future Northern High/Middle School and on to the proposed Utility Line Greenway. It does not follow any easement or drainageway and open space buffer. It follows Cedar Hollow Road and Sutter Road as a Type V facility from the future state park, crosses NC150, and continues through mostly undeveloped forest land as a Type III through the future school property and on to the proposed Utility Line Greenway.

64. Northwest School Greenway

This 3.2-mile Type II, III, and V greenway connects the future Piedmont Greenway, Northwest High School and Northwest Middle School to the proposed Bald Eagle - Beech Bluff Connector in the Watershed region. It follows the drainageway and open space buffer of Moores Creek southward from the Piedmont Greenway, along the east side of the school property, as a Type III until Alcorn Road where it becomes a Type V facility crossing Pleasant Ridge Road to the east. It briefly follows Ridge Haven Road before returning to the off-road environment at Oak Bend Park as a Type IV facility. It follows parkland through the Cardinal subdivision and River Hills Plantation Park. It continues to follow off-road drainageway and open space buffer and City-owned land as a Type II until it reaches Brass Eagle Loop and the merging of the Bald Eagle Trail and Beech Bluff Trail.

65. Osprey Trail Extension

The Osprey Trail Extension extends the Osprey Trail around a southwestern finger of Lake Townsend, completing the connection to the existing Westhouse Trail. Like the majority of the Watershed trails, it is a Type II facility in City-owned land surrounding the lakes. Because it traverses some potentially wet locations, further investigations would be necessary to determine where boardwalk is necessary. A safe crossing at Church Street, with signage and a crosswalk, would be necessary.

66. Piedmont Greenway

The Piedmont Greenway is an ongoing effort connecting the communities of Forsyth County to the communities in Guilford County. It is planned to be a 19-mile multi-use trail, with a 9-mile network of spur trails that will connect Greensboro to Kernersville, Triad Park, and Winston-Salem. Specifically in this study area, it connects Triad Park to the Watershed trails system at the Lake Higgins Trail. Presently, the Piedmont Land Conservancy is discussing potential corridors to determine the exact alignment of this trail.

67. Pine Cone Greenway

Crossing northern Greensboro, the 4.9-mile Pine Cone Greenway serves as an important spine in the proposed trails network. A combination of Type IV and V facilities, this trail utilizes Cone Boulevard from the proposed Battleground Rail Trail and Battleground Avenue to the site of the former Carolina Circle Mall, just east of US 29. Specifically, the trail runs east from Battleground Avenue along Fernwood Road. It then follows the linear Kirkwood Park along Liberty Road, traveling through a drainageway and open space corridor until it meets Cone Boulevard. It crosses to the north side of Cone near Mendenhall Middle School, providing a location for a safe school crossing, and utilizes stretches of City-owned linear open space along Buffalo Lake. It moves eastward to the commercial areas near the intersection of Cone Boulevard and Church Street. It utilizes existing sidewalk along Cone Boulevard with service to the proposed Utility Line Greenway #4 and Joe Davis Greenway. Finally, it follows existing sidewalk at the US 29 overpass and circles around the east side of the former Carolina Circle Mall property, connecting to the Greensboro SportsPlex. It travels into woods and connects with the proposed North Buffalo Creek Greenway. Overall, this majority Type V trail provides east-west service across a diversity of land uses and would be an excellent multi-use trail facility, connecting the commercial district along Battleground

Avenue to the new commercial development at the former Carolina Circle Mall. Obstacles include narrow areas along Buffalo Lake and numerous high congestion street crossings, such as Lawndale Drive, Cone Boulevard, Elm Street, Church Street, Yanceyville Street, and Summit Avenue that would need improvement.

Figure 4(z). Kirkwood is a linear park on the western end of the recommended Pine Cone Greenway.

68. Pleasant Garden Greenway

The 3.3-mile Pleasant Garden Greenway forms an important link between southern Greensboro and the town of Pleasant Garden along a drainageway/open space corridor. It runs north-south from the proposed South Buffalo Creek Greenway at the Interstate Industrial District to Ritters Lake Road and the proposed Big Alamance Creek Greenway. It utilizes linear City-owned open spaces and sections of a utility line corridor. The majority of this trail is Type IV, with Type V necessary at the I-85 crossing along Pleasant Garden Road.

68A. Spur: The Pleasant Garden Greenway has a spur to the Brown Center Park.

69. Price-Jefferson Connector

The 0.4-mile Type IV Price-Jefferson Connector provides a connection from Price Park to Jefferson Elementary. It starts at the southwestern portion of the Price Park Greenway from Price Park, westward through Robin Ridge Park, along the south side of Jefferson Elementary School ground and eventually to New Garden Rd. sidewalk. This is not one of the 2000 bond referendum Connector Routes.

70. Price Park Greenway Extension

The 1.7-mile Price Park Greenway Extension provides an important connection between Price Park and the Bicentennial Greenway. It extends the Price Park Greenway in northwestern Greensboro along lands between the Hebrew Academy and Bryan Boulevard. This trail runs to Jefferson Road where it also meets the proposed Red Oak Greenway. Boardwalk may be needed to cross the wet areas on the Hebrew Academy property. Because this drainageway is culverted at Bryan Boulevard, the Price Park Extension Greenway utilizes sidewalk along Jefferson Road to cross underneath Bryan Boulevard, via an underpass, where it meets the Price Park Greenway Extension. This alignment then utilizes a future sidewalk/bikeway along the north side of New Garden Road. From New Garden Road, the trail is off-road, meandering north through some low-lying areas along a drainageway and open space corridor, providing access to neighborhoods, before crossing Horse Pen Creek and reaching the Bicentennial Greenway. Further wetland investigation will be necessary to determine the driest and least-impact alignment. Boardwalk may be required in some instances and a bridge will be necessary across Horse Pen Creek. Because of the various possible trail conditions, the trail will require Type III, IV, and V treatments.

70A-70D. Neighborhood Spurs: Four smaller spurs connecting into neighborhoods are proposed, particularly, along neighborhood HOA common spaces, utilizing patches of greenspace. Spur #1 is the Kernodle Connector that links the Saddle Creek neighborhood



across Horsepen Creek to the Bicentennial Greenway near Carolyn Allen Park.

70E. Brassfield Spur: A branch off of the Price Park Extension Greenway, this short loop trail in northwestern Greensboro connects the neighborhoods off of Brassfield Road and provides linkages to both the Bicentennial Greenway and Price Park via the Price Park Extension Greenway. Negotiations with homeowners will be necessary to determine the final alignment of this corridor and private neighborhood use should be considered.

Figure 4(aa). Cleared sewer easement north of New Garden Road continues the Price Park Greenway Extension opportunities.

71. Price Park Extension - Gracewood Connector

This 0.75-mile, Type IV trail connects the Price Park Extension Greenway to the Gracewood Greenway, paralleling the north side of Bryan Blvd. Adequate space generally exists between Bryan Blvd and adjoining neighborhoods and a significant amount is multi-family, undeveloped common areas. A very safe crossing at New Garden Road is very critical because of the road speed and curves of the road in both directions. A cleared sewer easement exists on the south side of New Garden with cleared open space eastward along Bryan Blvd. Topography may be an obstacle with one section of steep terrain. Further study into the environmental constraints and easement negotiations is necessary to determine the alignment and facility type of this connector. This is not one of the 2000 bond referendum Connector Routes.

Figure 4(bb). Easement that parallels Bryan Boulevard.

72. Red Oak Greenway

The 1.7-mile Red Oak Greenway provides an important connection between Price Park and neighborhoods to the East and North, including Carriage Hills and Friendly Acres. From the existing Price Park Evergreen Trail, it moves east, crossing Jefferson Road, and turns north on the other side of Bearhollow Road along a long stretch of City-owned park land / drainageway and open space corridor. It parallels Bearhollow Road until it meets Jefferson Road. It follows sidewalk along Jefferson Road to the north briefly until it ends at the recommended Price Park Greenway Extension at Bryan Boulevard.

72A. Claxton Elementary Spurs: Spurs utilizing City-owned parkland, through Westridge Valley Park provides access to a neighborhood, recreation facility,

Claxton Elementary School, Pinetop Road, and Heathrow Court from the Red Oak Greenway.

Figure 4(cc). Easement through Carriage Hills neighborhood paralleling Bearhollow Road.

73. Redbud Greenway

The 2.8-mile Redbud Greenway, in northern Greensboro, runs generally east-west from Country Park to its terminus at the North Elm Street sidewalks. While the majority is a Type IV off-road facility, a very short portion of the trail would require a Type V treatment along Lake Jeanette Road, Pineburr Road, and Driftwood Road. It utilizes long stretches of city-owned drainageway and open space corridors and parklands, such as Three Meadows Park, the Reserve at Richland Creek, as it weaves through residential neighborhoods, such as the Reserve and Three Meadows. Other trails that can be accessed from the Redbud Greenway include the Hickory Greenway and Birds Nest Greenway. A crossing at Lawndale Drive is necessary. The construction of the I-840/ future Urban Loop may also impact the Redbud Greenway corridor.

74. Reddicks Creek Greenway

This 8.3-mile, Type III, IV, & V trail runs from the proposed South Buffalo Creek Greenway southward to the proposed Utility Line Greenway #2. It forms an important spine in the extreme southwestern portion of Greensboro. As it traverses southward, it encounters less dense residential areas and more open space in southern Guilford County. The northern portion crosses I-40 using existing sidewalk on Merritt Drive, follows open space along Fairfax Road parallel to I-40 and jaunts southward through linear neighborhood open space, along a sewer easement, by Alderman Elementary School. It utilizes sidewalk as a Type V facility along High Point Road, serving commercial areas. Within this region, the Southwestern Loop Greenway breaks off this trail in two spots. From High Point Road, it follows linear parks and the drainageway/open space buffer of Reddicks Creek to its terminus at the Utility Line Greenway #2. The Dogwood Greenway splits off at the Grandover West Office Park. Obstacles include road crossings at Fairfax Drive and High Point Road and also negotiating an easement through a golf course.

Figure 4(dd). Wide linear open space corridor between Fairfax Road and I-40.



Figure 4(ee). Sewer easement at Bernau Street provides an obvious opportunity for the Reddicks Creek Greenway.

Figure 4(ff). Underpass provides plenty of width and clearance for the Reedy Fork Greenway under US 29.

75. Reedy Fork Creek Greenway

The Reedy Fork Creek Greenway would connect Bryan Park to the Alamance County border along Reedy Fork Creek. This 17-mile corridor would have a combination of Type IV and III characteristics, allowing travel for multiple uses. This greenway corridor has the great potential of becoming a portion of the MST Trail. This trail provides connections from the Watershed Region and Bryan Park to Northeast Park and on towards the Haw River and Alamance County. The underpass crossing at US 29 is very adequate, providing excellent opportunity. Obstacles include some wetland areas and the need to cross a high-speed railroad that runs along the eastern border of Bryan Park.

76. Reedy Fork Creek Paddle Trail

The Reedy Fork Creek Paddle Trail is a Type VI water trail that runs eastward from the Lake Townsend along Reedy Fork Creek. It would provide canoe/kayak access from the Bryan Park area and US 29, eastward to Northeast Park and Alamance County. Signage directing users is recommended, along with appropriately-placed access points.

77. Rock Creek Greenway

The 8.3-mile Rock Creek Greenway, in eastern Guilford County, begins as a Type II facility, at the proposed Little Alamance Creek Greenway and ends at the proposed Buffalo Creek Greenway. The trail follows an existing greenspace and creek corridor and connects Sedalia and Guilford-Mackintosh Park to Northeast Park. The trail follows an undeveloped rural landscape and would provide an excellent recreational opportunity. County Road and I-40 crossings provide obstacles, so underpasses and safe crossings need to be investigated.

78. South Buffalo Creek Greenway

The 21-mile, mostly Type IV South Buffalo Creek Greenway forms another key spine in the proposed greenway system. It begins in the west at the Bicentennial Greenway. It runs through the south-central portion of Greensboro to merge with the North Buffalo Creek Greenway and the Buffalo Creek Greenway. It provides numerous connections to underserved areas along with other proposed greenways, parks (including Barber Park), commercial and residential areas, industrial parks, and schools.



The type of trail facility should match the surrounding landscape and therefore the majority of this trail should be Type IV within the City of Greensboro, with a more natural surface, Type III, as the trail moves east, through more rural areas outside the City.

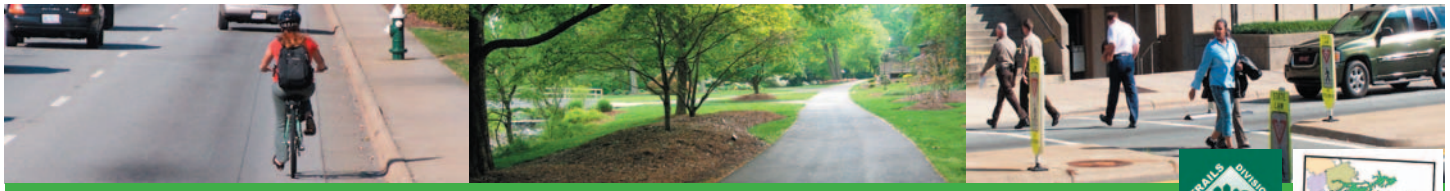
Figure 4(gg). A cleared easement and access road parallels S. Buffalo Creek, here at Willow Road.

Both opportunities and obstacles are numerous. While the corridor crosses I-40 numerous times, most underpasses provide adequate clearance and space while other road crossings provide more of a challenge, including Freeman Mill Road, High Point Road, Wendover Avenue, Lee Street, and others. Signage and crosswalks will be needed in many locations. A large wetland and inflatable dam project, funded by the Clean Water Management Fund, near Rehobeth Church Road, offers a great educational resource along the corridor. The utilization of existing sidewalks and creation of bikeways may be necessary to ensure connectivity. In general, further evaluation and study will be necessary along the entire length of this proposed trail corridor. The future Urban Loop/I-840 is a major obstacle that requires a creative design solution/coordination to complete this trail corridor at its eastern end. Due to the length of the greenway and obstacles, the development will occur segment by segment.

A portion of this greenway, in Hillsdale Park, also contains the Hillsdale Connector, a proposed 2000 bond referendum, City-proposed Connector Route.

Figure 4(hh). A large wetlands project along the S. Buffalo Creek provides an educational opportunity for the greenway.

Figure 4(ii). A beautiful railroad bridge at the S. Buffalo Creek provides plenty of space and clearance for the recommended greenway at the Interstate Industrial Park.



79. SE Connector Greenway

The 3-mile SE Connector Greenway, a 2000 bond referendum Connector Route, provides an important linkage between the Downtown Loop and Florida Street/Barber Park, providing connectivity to the larger Greensboro network for a generally underserved area. This trail begins at the Downtown Loop Trail, near Lee Street. As a Type V trail facility, this alignment proposes using the eastern side of Freeman Mill Road to Florida Street. Along Florida Street, the adjacent greenspaces, such as Sussman Street Park and Ross Street Park, are used to provide a larger buffer between the on-road sidewalk/sidepath and the roadway. Although some sidewalk segments are existing along Florida Street, it is recommended that the facility be expanded in width where possible to host multiple uses and/or bicycle lanes/shoulders be added. This Connector Route contains many spurs, shown below.

79A. Spur: At the western end of this proposed trail a spur utilizes South Street and Ashe Street to access the Warnersville Center and Jones Elementary School.

79B. Spur: Another spur from Dorothy Brown Park utilizes a greenspace corridor to access Ross Street Park.

79C. Spur: A third spur creates a Type V linkage along South Side Boulevard to the Kindred Home Hospital Nursing Home.

79D. Dudley H.S. - Barber Park Spur: This 1.5-mile spur trail, in southeastern Greensboro, provides a combination of off-road and on-road facilities to logically connect three schools (Bluford Elementary School, Dudley High School, and Lincoln Middle School), and ultimately connect the schools and surrounding neighborhood to Nocho Park. Surrounding the schools, this trail alignment would take advantage of existing sidewalk facilities. This spur begins at SE Connector, where a safe crossing would be necessary across Florida Street from Barber Park. From Barber Park, this trail utilizes a linear drainageway and open space corridor/sewer easement, mostly through Cottage Grove Park and Lennox Park, which parallel English Street. Existing sidewalk along Pear Street provides access to the school grounds. From the school grounds the trail follows existing sidewalk along Lee Street to Nocho Park. An existing pedestrian underpass should be used and improved to create a connection to the Windsor Center.

Figure 4(jj). Lee Street underpass allows safe crossing of Lee St. from Nocho Park to the Windsor Center as part of the Dudley High School - Barber Park Spur.

80. Sedalia's Greenway

The 8.9-mile, mostly Type III Sedalia's Greenway follows drainageway and open space buffers from the Northeast Community Trail southeastward to Burlington Road and the Town of Sedalia. It traverses mostly undeveloped land and crosses the South Buffalo Creek Greenway corridor. Nearing Sedalia, it follows sidewalk along Burlington Road as a Type V facility accessing Sedalia Elementary, the Charlotte Hawkins Brown museum, shopping areas in Sedalia, and the Rock Creek Industrial Park before ending at the eastern edge of Sedalia and the proposed Rock Creek Greenway. Easement acquisitions would be

necessary and the trail should be constructed as development occurs and as the population can support trail use in this region. The future Urban Loop/I-840 is a major obstacle that requires a creative design solution/coordination to complete this trail corridor.

81. Skipping Rocks Greenway

The Skipping Rocks Greenway, a proposed Type II addition in the Watershed Region, begins at Church Street, across from the Reedy Fork Trail and ends at Bryan Park, over 9 miles later. This natural-surfaced, recreational trail segment would complete the connection of the northern Watershed Trail System, along scenic Lake Townsend, to Bryan Park. Some obstacles include wetland areas in need of protection, along with some roadway crossings in need of improvement.

82. Sleepy Hollow Greenway

In northwestern Greensboro, the 2.9-mile Sleepy Hollow Greenway creates a loop trail system with the Palmetto Trail and Bicentennial Greenway and is a mix of Type III and V facilities. It runs west from the Palmetto Trail and Lake Brandt, utilizing open space and Highland Meadows Park. It travels south from Lauren Run subdivision providing service to Battleground Charter Academy and Guilford Day School. The proposed Utility Line Greenway #3 and Bicentennial Greenway intersect this trail. It crosses Horsepen Creek and provides access to the proposed Horsepen Creek Greenway. This trail finally connects to Brassfield Road and the proposed Gracewood Greenway, utilizing common open space in Camden Falls and Chelsea Commons subdivisions. Obstacles include the crossing at Horsepen Creek and the necessity of acquiring easements in privately-owned parcels.

83. Southern Hospitality Greenway

Referencing the street names with a southern US city theme in the Southmont neighborhood, the Southern Hospitality Greenway runs from Savannah Street to the proposed Meadowview Greenway at Meadowview Road It follows City-owned park land, such as Southmont and Spring Valley Plaza, for the entire length. This proposed trail in southern Greensboro crosses only Mobile Street. With ample space and few obstacles, this trail provides a nice neighborhood opportunity that can ultimately connect the Spring Valley shopping center and the South Buffalo Creek Greenway corridor.

Figure 4(kk). City-owned open space at Spring Valley Plaza stretches northward from Meadowview Road behind single-family residential housing, providing an easement for the Southern Hospitality Greenway.

84. Southwestern Loop Greenway

The Southwestern Loop Greenway is a long, 6.8-mile trail in an underserved area of southwestern Greensboro, running through linear parks and drainageway and open space buffers. It completes a loop off of the proposed Reddicks Creek Greenway. It provides service to many residential areas, Oka Hester Park, Twin Lakes Park, Hampton Park, and neighborhood linear parks such as Pinecroft Lake Park, Rolling Roads Park, Greentree Park, and Springbrook Park. The majority of the Southwestern Loop Greenway weaves through the off-road environment as a Type IV facility, but utilizes roadway as a Type V along Wayne Road,



McCuiston Road, and along short segments of Creek Ridge Road, Vandalia Road, and Cypress Park Road. It begins at the Reddicks Creek Greenway and High Point Road running eastward, utilizing linear open space through apartment complexes, Wintergarden Park, and drainageway and open space buffers. Crossing Holden, it follows parkland at Lamrocton and Twin Lakes Park and to Pinecroft Lake Park parallel to Cypress Park Road. Pinecroft Lake Park contains a boardwalk and an education exhibit about the neighborhood wetlands. The greenway crosses Pinecroft Road, passes along Willow Lake to Rolling Roads Park where it connects with the Rolling Roads Greenway and turns southward through another finger of Rolling Roads Park. It utilizes existing sidewalk southward to Hampton Park and the linear Greentree Park where it turns back to the west. It follows the McCuiston Road and Vandalia Road corridor to Oka Hester Park and Trotter Recreation Center where a sidewalk/bikeway would be necessary. A spur into Oka Hester Park is recommended. The greenway follows Wayne Road to where it meets the recommended Reddicks Creek Greenway again to the south at Kings Pond. Safe roadway crossings would be necessary throughout, especially at Holden Road, Vandalia Road, and Creek Ridge Road. Traversing multiple land uses, this trail will require easement acquisition. The future Urban Loop/I-840 is a major obstacle that requires a creative design solution/coordination to complete this trail corridor.

85. Squirrel Greenway

The 4.2-mile, Type III Squirrel Greenway runs north-south from the Reedy Fork Creek Greenway to the North Buffalo Creek Greenway in northeast Guilford County. It follows a drainageway and open space buffer through currently undeveloped lands, along the backside of the Reedy Fork Ranch development (in the north). It crosses Hines Chapel Road and Creekview Road where adequate crosswalks are needed.

Figure 4(ll). Wetlands educational signage and boardwalk at Pinecroft Lake Park. This park is one of many served by the recommended Southwestern Loop Greenway.

86. Starmount Greenway

The 1.1-mile Starmount Greenway runs east-west in west-central Greensboro, connecting the Hamilton Lakes Trails with Arboretum trails. It runs along Starmount Drive as a Type V facility on the north side of the Starmount Golf Course. It runs briefly along Holden Road entering the City-owned Starmount Natural Area where a greenway was constructed in 2005. It crosses Market Street to connect into the Arboretum trail system. Safe crossings would be necessary at Holden Road and Market Street. Negotiations with the Starmount Golf Course may be necessary depending on Starmount Drive's right-of-way.

Figure 4(mm). 2005 construction of Starmount Park greenway.

87. Summerfield-Stokesdale Rail Trail

At nearly eleven miles, this proposed Type III and IV trail utilizes a former railroad transportation corridor with minimal obstacles and numerous opportunities. Beginning in the town of Stokesdale, this railroad corridor parallels US 158 until just before Flat Rock Road. Here the railroad bed dramatically bows to the south towards the Haw River. The corridor travels south, across US 150, through the town of Summerfield and across US 220 to meet up with the Vineyard Trail, north of Strawberry Road. An existing trestle across the Haw River and an underpass at US 150 could be used to complete the connection. A culvert is recommended at US 220 and current NCDOT policy will require a local government match.

Figure 4(nn). Abandoned railroad corridor under US 150.

This trail would provide transportation and recreational opportunities to the towns in northwestern Guilford County, linking the existing communities, new developments, and schools into the larger Greensboro trail network. This trail provides access to the Mears Fork Creek Greenway, the Haw River Greenway, trails in the Watershed Region, and the Bicentennial Greenway. This corridor could become an excellent off-road piece of the MST Trail that would continue the Watershed trails MST portion. The success of this project requires the cooperation of adjacent landowners, the acquisition of the railroad right-of-way, and a safe crossing option for US 220.

88. Sunset Greenway

Near central Greensboro, the 1.5-mile Sunset Greenway provides an important connection from the Lake Daniel Greenway to the Arboretum through a combination of Type IV and V facilities. It follows linear neighborhood open space through the Sunset Hills neighborhood. It utilizes existing sidewalk along Berkley Place, connecting to Lindley Elementary School. The trail crosses Wendover Avenue at Market Street utilizing existing sidewalk. Just across Wendover Avenue it connects to the northeast side of the Arboretum. Signage should indicate directions to/from the Lake Daniel Greenway to the Arboretum.

Figure 4(oo). Access road and easement provide an excellent scenic corridor just south of Air Harbor Road for the Sweetgum Greenway.

89. Sweetgum Greenway

The 3.2-mile Sweetgum Greenway runs north-south from the Laurel Bluff Trail (in the Watershed system) to the Guilford Courthouse National Memorial Park trail



system. It utilizes a large amount of city-owned open space, along with some stretches of on-road sidewalk/bikeway, making it mostly a Type IV and V facility. This trail provides connection to the proposed Air Harbor and Hickory Greenways. It traverses Regents Park and meanders along the western edge of Lake Jeanette, generally moving through north-central Greensboro's residential neighborhoods. The future Urban Loop/I-840 is a major obstacle that requires a creative design solution/coordination to complete this trail corridor.

90. The 29 Greenway

The 5.4-mile 29 Greenway provides a mostly off-road Type IV trail in an underserved area of northeast Greensboro. It runs east-west from the proposed Utility Line Greenway #4 near Yanceyville Road to the North Buffalo Creek Greenway. It accesses the Craft Center Park, following drainageway and open space buffers through residential areas. Upon arriving at US 29, it follows the access roads along both sides as a Type V facility utilizing the existing US 29 pedestrian bridge as a means to cross US 29. The access roads need to be improved to accommodate an on-road trail facility. The existing pedestrian bridge area should also see improvement including better aesthetics, maintenance, and accessibility. East of US 29, it follows the North Buffalo Creek tributary, passing through Brown Industrial Park open space into mostly undeveloped land. Exact alignments and easements may vary in some residential areas where the trail negotiates numerous single-family parcels, west of US 29, near Murchie Park. The most significant obstacle is the railroad crossing on the western half of the trail.

91. Townsend Trail Extension

This short trail simply extends the existing Townsend Trail eastward along the edge of the Bryan Park Golf Course. This trail is a Type IV and V facility, utilizing Townsend Road for the on-road segment. It joins the proposed Reedy Fork Creek Greenway, MST Trail, and proposed Bryan Park Greenway.

Figure 4(pp). The pedestrian bridge over US 29 is an excellent facility but could use some improvements including better accessibility and area maintenance.

92. Triad-Weaver-Regional Industrial Park Greenway

This 2.7-mile greenway weaves through industrial parks on the extreme west side of Greensboro. Contained within the industrial complexes in linear parkland/open space, it would provide a recreational amenity. Starting in the Triad Industrial Park, it runs east through the Federal Express Park and the northern end of the Weaver Interstate Industrial Park as a Type IV facility. It turns north crossing the railroad along Thatcher Road until it meets existing sidewalk along Market St. It continues north from Market St. along narrow linear parkland, drainageway and open space buffer, and a sewer easement along Regional Center parkland as a Type III. It terminates at the northwest side of Bingham Enterprise Office Park.

93. Utility Line Greenway #1

This 7.1-mile trail runs from the proposed Haw River Greenway in northern Summerfield to the Reedy Fork Trail in Greensboro's watershed region as a Type II



facility. Utilizing the power line corridor, this trail also crosses the Mears Fork Creek Greenway and follows a drainageway and open space buffer as it nears the Reedy Fork Trail. Scalesville Road and NC 150 need adequate roadway crossings. The topography of this corridor may present some challenges. Negotiations with the utility company will need to be pursued.

94. Utility Line Greenway #2

This 11-mile, Type II trail runs east-west from the proposed Reddicks Creek Greenway, near High Point, to the proposed Big Alamance Creek Greenway, near Hagan-Stone Park. It follows a major utility line corridor making negotiations with the power company necessary. Further investigation into topographic constraints will need to be conducted. It runs through Pleasant Garden and has a proposed short spur into Hagan-Stone Park. Roadway crossings are needed across many rural roadways and US 220. Negotiations with the utility company will need to be pursued.

95. Utility Line Greenway #3

Just north and west of the Urban Loop (I-840), this Type III trail runs east-west for 1.9 miles along a power line corridor from the Beech Bluff Trail and proposed PTI Greenway to the proposed Sleepy Hollow Greenway. It provides a connection from the general Battleground Avenue/Bicentennial Greenway region westward to the PTI Greenway. Some rural roadway crossings are necessary. Negotiations with the utility company will need to be pursued.

96. Utility Line Greenway #4

The fourth Utility Line Greenway in the proposed network runs north-south for 3.8 miles from the Osprey Trail and Lake Townsend to the Pine Cone Greenway at East Cone Boulevard, in northern Greensboro. A mostly Type III with sections of Type V, this greenway provides a connection from the watershed region, through residential areas, to the Craft Recreation Center, and finally to the commercial region of Cone Boulevard/Highway 29. It utilizes a power line corridor with a wide, undeveloped easement until its meeting with Cone Boulevard's commercial areas where it utilizes existing sidewalk. Crossing solutions will need to be provided across Lees Chapel Road, as well as the future Urban Loop/I-840. Topography varies and further investigations into the exact alignment within the easement will be necessary. Finally, negotiations with the utility company will need to be pursued.

Figure 4(qq). Utility corridors provide wide, open easements for trail development, here at Lees Chapel Road.

97. Vance Arlington Greenway

The 1.1-mile Type IV Vance Arlington Greenway serves an underserved residential area, running north-south and connecting East Florida Street to Bragg Street and the Downtown Loop Trail. Promoted by local neighborhood groups and the Department of Housing and Community Development, this corridor was previously identified and utilizes existing sidewalk along Vance Street connecting to a small stream/sewer easement within a drainageway and open space corridor. A worn footpath and bridge already exist in Arlington Park along this proposed alignment, suggesting this



corridor is already used by area residents. The drainageway and open space corridor runs parallel between Lance and Arlington Streets from the intersection with Burtner Street to Bragg Street. Negotiations with residents, neighborhood associations, and some northern end commercial owners will be necessary to acquire easements.


Figure 4(rr). Open space and easements along the recommended Vance Arlington Greenway.

98. Vanstory Connector (Hillsdale Park Trail)

The Type V 0.9-mile Vanstory Connector provides a connection from the proposed S. Buffalo Creek Greenway and Hillsdale Park to the Four Seasons Town Center, Smith Athletic Complex, Smith High School and existing Connector sidewalk. It would follow Meadowview Rd to the south and east to Vanstory, where it would utilize existing sidewalk to cross I-40. On the south side of I-40, safe crossings would be necessary for all entrances and exits to/from the Four Seasons Town Center. This is one of the 2000 bond referendum Connector Routes.

99. Wendover Greenway

A Type V facility, this trail would improve pedestrian conditions along Wendover Avenue, just east of I-40/ Big Tree Way to Tri-City Boulevard at a critical juncture in the proposed trail network. It provides service to the proposed Mitchell Greenway, Brandywine Greenway, and South Buffalo Creek Greenway. Wider, multi-use sidewalks are recommended with state-of-the art signalized crosswalks along this commercial area in southwestern Greensboro.

100. Woodlea Greenway

The Woodlea Greenway, in southern Greensboro, runs north-south for approximately 2 miles from the proposed Greenhaven Greenway Trail Extension, south to its terminus at the Cotton Greenway. Near the junction with the Greenhaven Greenway Trail Extension is the South Elm Center office park. This trail runs through Woodlea Acres Park and generally follows a drainageway/open space corridor. The majority of the trail is a Type IV facility, utilizing on-road Type V at the extreme southern end along Randleman Road. Roadway crossings are needed, particularly to cross Vandalia Road.

4.2.4 Ancillary Greenway Facilities

In addition to the recommended greenways of section 4.2.3, ancillary facilities are necessary to support and enhance the system. Informational and directional signage, safe roadway crosswalks, and trailheads are critical for a user-friendly and safe experience and are discussed below. Lighting, emergency call boxes, planting, educational plaques/signage, and benches are a few of the amenities that further enhance this experience. Design guidelines for all of these ancillary facilities are described in Appendix C.

Signage

Information and directional signage provide the user with helpful maps, directions, safety information, and rules to make the experience safer and more enjoyable. Some signage is found along existing greenways but typically, directional signage to nearby parks and other greenways is nonexistent. In order to promote connectivity, signage directing users to trip attractors and other parts of the greenway system is critical. A current example is the adjacency of the



Bicentennial Gardens and Bog Gardens. Signage directing users to/from each trip attractor would enhance the walkability of the area. Recommended improvements, including the placing of signage, are shown in Figure 4(ss).

Safe Roadway Crossings

Safe roadway crossings are another very key element of a safe comprehensive network of greenways. Major and minor urban and rural roads are crossed in the recommended greenway network with regularity because of the built-out nature of Greensboro. These crossings are discussed for each greenway above. Crossings are needed at intersections and mid-blocks in order to provide safe connectivity of the recommended greenway system.

Specific locations needing improved crossing facilities include the Watershed region trails across Lake Brandt Road, Strawberry Road, Church Street, and Yanceyville Street. Currently, individual watershed trails end at these roadways often with another beginning at a location across the roadway. There is no signage directing the trail user, no crosswalk, and no advance warning crossing signage for motorists.

Trailheads

Trailheads are an important piece of the network, providing parking, facilities, and information signage to trail users. The trailhead shapes the users' first impressions of the greenway, so the appearance and function is important. Trailheads should be developed next to public rights-of-way (usually roadways) and serve as the primary public access to the greenway. Parks, City-owned land, and locations near multiple trail intersections or trip attractors should be considered as locations for trailheads. They should also be geographically distributed to serve all areas. Trailhead parking should be established, where possible, at significant greenways throughout the region. Specific ideal trailhead locations for parking include the east end of Latham Park Greenway and west end of Lake Daniel Greenway.

There are numerous existing trailheads of various appearance and function, mostly found in the Watershed region trails. Typically, these trailheads are simply gravel parking areas on the side of a road. Some of these trailheads should be improved to include clearer entry signage, additional parking, and/or other facilities.

Recommended trailhead sites (where no trailhead currently exists or an existing trailhead needs improvement) are shown on the greenway recommendations map and listed in Table 4(c). Further investigation into site-specific conditions and environmental and acquisition constraints will be necessary. These mapped sites represent ideal locations based on both existing conditions and the recommended greenway network. Trailheads may need to be constructed based on opportunity and land ownership availability. Opportunity often determines the exact site of the trailhead.

Also, because greenways will at times be near public parking lots, it is recommended that two actions be taken: 1) Establish cooperative relationships and partnerships with churches, businesses, etc. to allow for parking near trails and 2) Develop public education piece/map directing people to appropriate parking sites. This will assist in handling greenway parking issues during the development of the greenway network.

Figures 4(ss) and 4(tt) are two conceptual drawings showing examples of signage, crossing, and trailhead improvements at 1) Bicentennial Gardens/Bog Gardens and 2) Vineyard Trail/Lake Brandt Greenway. These drawings are only conceptual to help visualize



the benefit of these ancillary facility improvements throughout the region.

Recommended Trailheads*		
Greenway	Site	Facility
Battleground Rail Trail	Chandler Concrete - Battleground Ave.	New
Battleground Rail Trail & Bicentennial Gwy	Country Park	Needs Improvement
Bicentennial Gwy	Carolyn Allen Park - Drawbridge Pkwy	Needs Improvement
Bicentennial Gwy	Hilltop Rd	New
Bryan Park Gwy	Bryan Park	New
Downtown Loop Trail & Muddy Creek Gwy	Murrow Blvd	New
Friends Gwy & Bicentennial Gwy	Carriage Crossing Park	New
Hamilton Lake Trail	Hamilton Lakes	New
Lake Brandt Gwy & Vineyard Trail	Strawberry Rd.	Needs Improvement
Lake Brandt Gwy & Watershed Trails	Bur-Mil Park	Needs Improvement
Lake Daniel Gwy	Friendly Ave.	New
Latham Park Gwy	Elm St.	New
Muddy Creek Gwys 1 & 2	Bywood Park	New
Muddy Creek Gwy #3	Foushee Park - Burlington Rd.	New
N. Buffalo Creek Gwy	Carolina Circle Mall - 16th St.	New
NE Community Trail	Keeley Park	New
Osprey & Townsend Trails	Yanceyville Rd.	Needs Improvement
Price Park Gwy	Price Park	Needs Improvement
Reedy Fork Gwy	Reedy Fork Ranch	New
Reedy Fork Gwy & Skipping Rocks Gwy	Church St.	Needs Improvement
S. Buffalo Creek Gwy	Barber Park	Needs Improvement
S. Buffalo Creek Gwy	Interstate Industrial Park - Thurston Ave.	New
S. Buffalo Creek Gwy	Rehobeth Church Rd. - Wetlands Project	New
S. Buffalo Creek Gwy	Hillsdale Park	New
Southwestern Loop Gwy	Oka T. Hester Park	Needs Improvement
Vance Arlington Gwy	Bragg St.	New

*Sites are approximate and may need to be adjusted based on opportunity and land availability.

Table 4(c). Recommended Trailhead sites.

Figure 4(ss). Conceptual Design Improvements
(Crossing and Signage Improvements)
Bicentennial Gardens - Bog Gardens

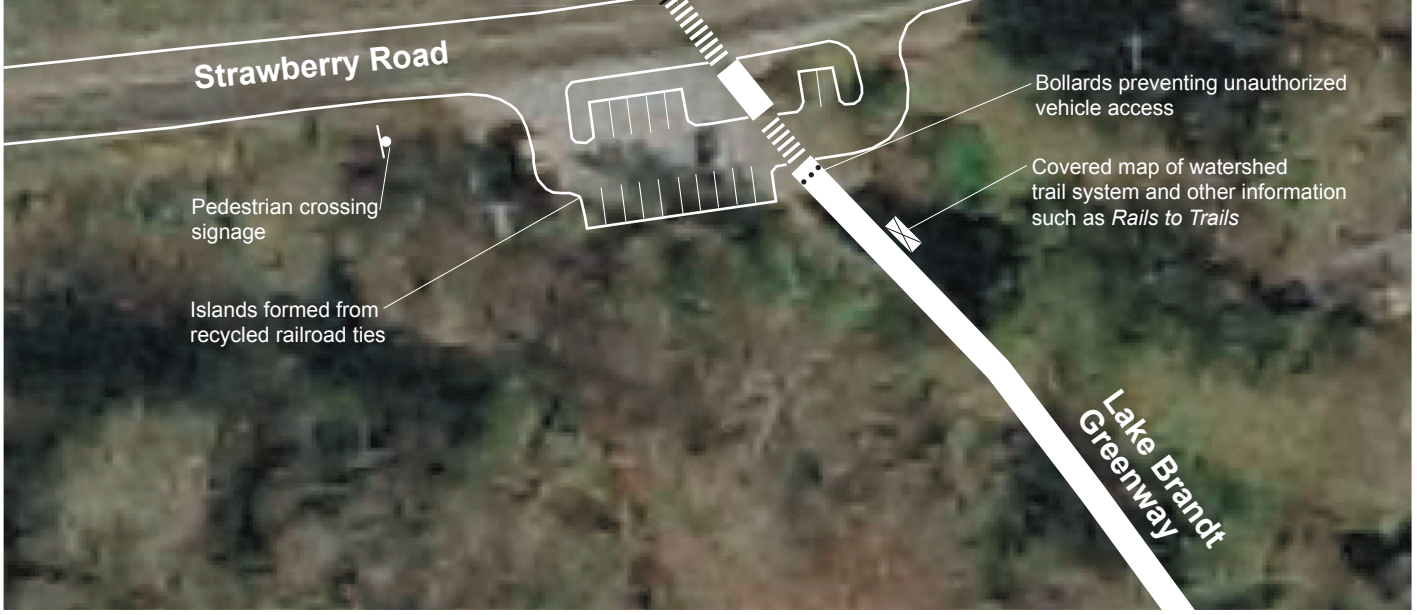


Figure 4(tt). Conceptual Design Improvements
(Crossing, Signage, and Trailhead Improvements)
Vineyard Trail - Lake Brandt Greenway



4.3 Bicycle Recommendations

4.3.1 Bicycle Facility Network Methodology

This section recommends a network of bicycle facilities that should be developed over the next twenty years to provide bicycle access to key destinations throughout the Greensboro Urban Area. The recommendations of this section are focused on roadway corridors, rather than greenway improvements. Greenway recommendations are discussed in the previous section of this chapter. The Greensboro Urban Area Bicycle Network was developed using a variety of sources, including:

- Public input
  - Public workshops
  - Online questionnaire
  - Meetings with stakeholder groups and communities surrounding Greensboro
  - Suggestions from the Bicycling In Greensboro (BIG) advocacy organization
- Field measurements taken during Fall 2005
- Locations of bicycle trip attractors (e.g., Downtown Greensboro, universities, schools, shopping centers, hospitals, parks, etc.)
- Connections to the existing and recommended greenway system
- Connections to bicycle routes and facilities in neighboring MPO's and counties recommended in the Piedmont Triad Rural Planning Organization Bicycle Plan.
- Bicycle Level of Service (Bicycle LOS) analysis conducted between November 2005 and February 2006
- Projects listed in the Greensboro Urban Area 2030 Long-Range Transportation Plan
- Projects listed in the City of Greensboro repaving program
- Projects listed for Division 7 within NCDOT's Statewide 2006-2012 Transportation Improvement Program

The process of recommending bicycle facilities for the network also considered existing roadway cross-sections, traffic patterns, and land use characteristics.

Specific bicycle facility recommendations were developed through iterative discussion process between GDOT staff and the consultant, which considered all of the factors listed above. The Greensboro MPO Technical Coordinating Committee (TCC) oversaw this process. These recommendations are subject to review and refinement over time, including through more detailed work in the project planning and implementation phases.

Figure 4(uu). Field measurements being taken along Lee St.

4.3.2 Bicycle Network Recommendations

The facilities that are recommended to improve bicycling conditions are shown on the Greensboro Urban Area Bicycle Facility Recommendations Map. The complete set of facilities designates a bicycle network that connects residential areas, downtown, and other bicycle attractors throughout the region, such as universities, schools, shopping centers, hospitals, and



other locations. This is referred to as the Greensboro Urban Area Bicycle Facility Network.

The facilities recommended for the network are summarized in Table 4(d), shown in Maps 4.3 and 4.4, and described in detail below. Each of the facility types is appropriate on different routes, depending on traffic, roadway, and land use characteristics. Methods of implementing the recommended bicycle facilities are also discussed in the following section.

A. Bicycle Lanes

A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes are always located on both sides of the road (except one way streets), and carry bicyclists in the same direction as adjacent motor vehicle traffic. The minimum width for a bicycle lane is 4 feet; five- and six-foot bike lanes are typical for collector and arterial roads.

Figure 4(vv). Bicycle lane in Washington, D.C.

Bicycle lanes provide several benefits, including:

- Increase the comfort of bicyclists on roadways
- Increase the amount of lateral space between motor vehicles and bicycles
- Show bicyclists the appropriate place to ride through complex intersections
- Make bicyclist and motorist movements more predictable
- Increase the capacity of roadways that carry mixed bicycle and motor vehicle traffic
- Make drivers more aware of the need to look for bicyclists before opening a car door from an on-street parking space

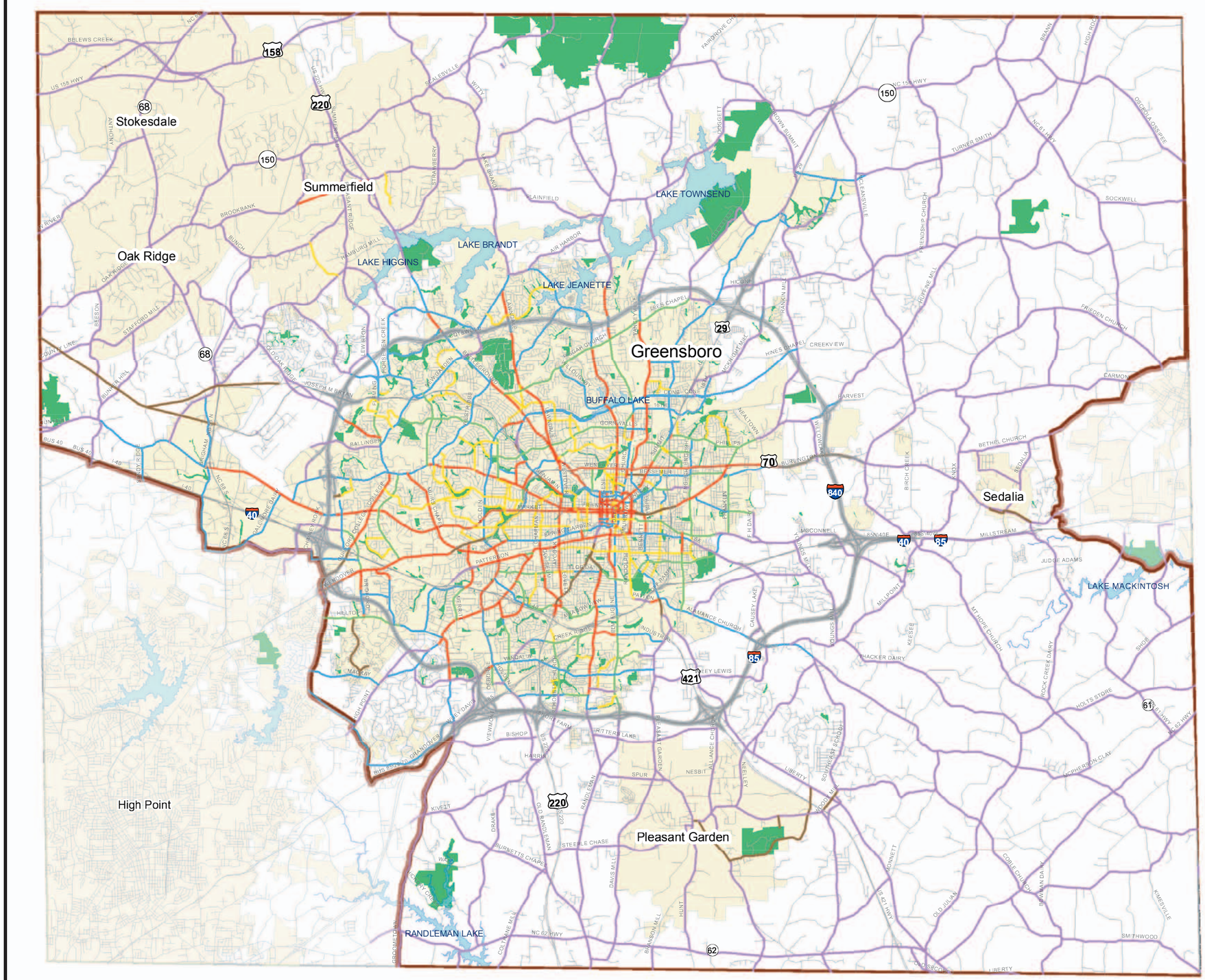
These benefits are described in more detail in the Pedestrian and Bicycle Facility Design Guidance section of Appendix C.

Bicycle lanes are recommended on several roadways in the Greensboro Urban Area with moderately high speed limits (35 m.p.h to 45 m.p.h). These bicycle lanes should be striped with high-visibility markings to increase driver awareness of bicyclists.

The roadways in this recommended bicycle facility category are sometimes wide enough to add new bicycle lanes by striping a four- or five-foot-wide space at the edge of the roadway and marking it as a bicycle lane with no other improvements needed. In other cases, road widening or reconstruction would be required.

B. Adding Bicycle Lanes by Changing Travel Lane Markings

There are many roadways in Greensboro that could potentially have bicycle lanes if the existing travel lane markings were changed. Two main categories of changes are recommended to create space for bicycle lanes on Greensboro area roadways: 1) narrowing the existing travel and/or parking lanes, and 2) removing existing travel and/or parking lanes.



Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Map 4.3

Recommended On-road Bicycle Facilities

Legend

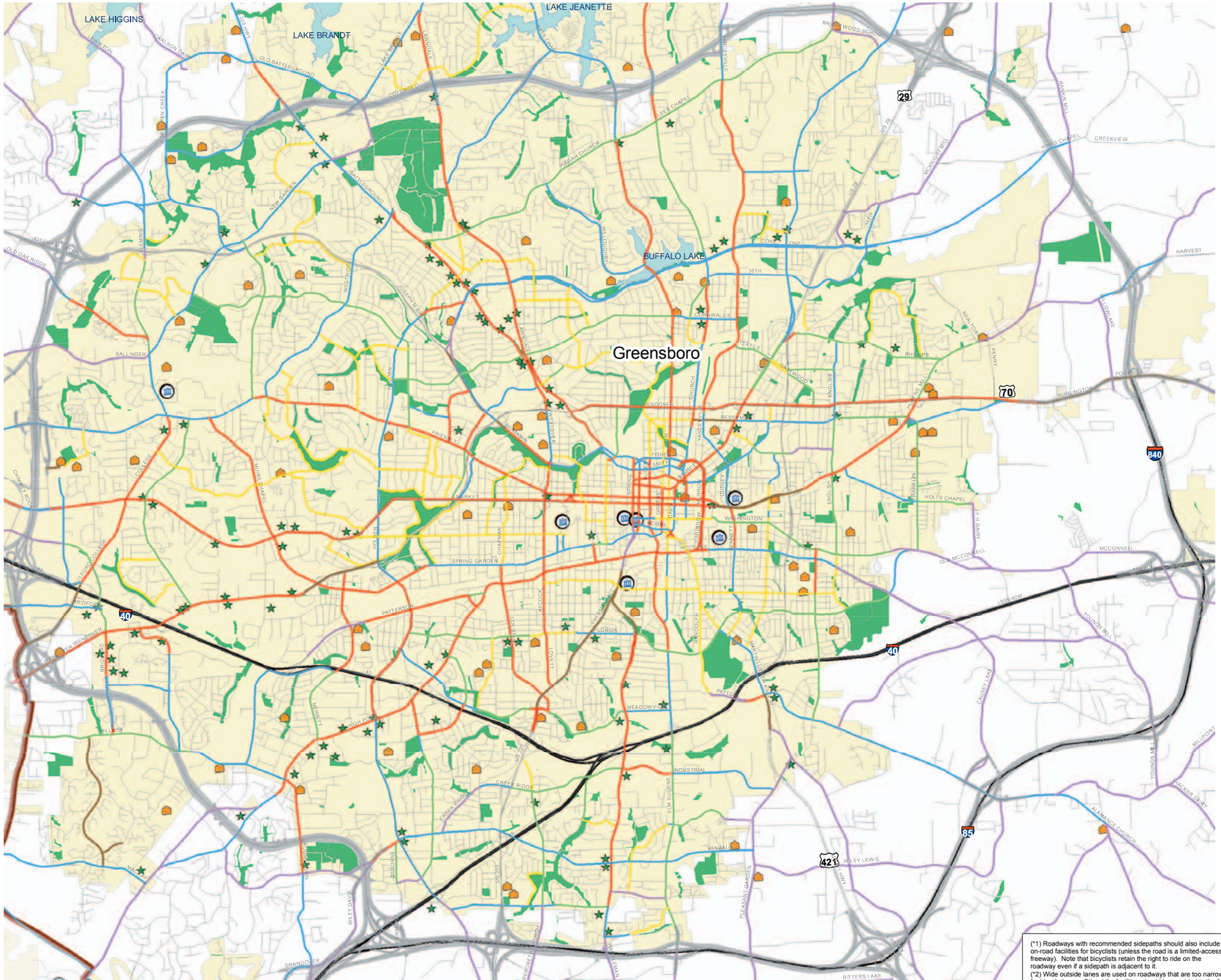
- Bicycle Lane
- Paved Shoulder
- Sidepath (*1)
- Other On-Road Bicycle Facility (*2)
- Connector (*3)
- Further Study
- Roadway (No Recommendation)
- Urban Loop
- Parks
- Incorporated
- Greensboro MAB
- Lakes

(*1) Roadways with recommended sidepaths should also include on-road facilities for bicyclists (unless the road is a limited-access freeway). Note that bicyclists retain the right to ride on the roadway even if a sidepath is adjacent to it.
(*2) Wide outside lanes are used on roadways that are too narrow for bicycle lanes. Other bike facilities should be provided in the future.
(*3) Connectors may have bicycle route signs, but do not require special facilities.

1 Miles

N

Data Source: City of Greensboro



(*1) Roadways with recommended sidepaths should also include on-road facilities for bicyclists (unless the road is a limited-access freeway). Note that bicyclists retain the right to ride on the roadway even if a sidepath is adjacent to it.
(*2) Wide outside lanes are used on roadways that are too narrow for bicycle lanes. Other bike facilities should be provided in the future.
(*3) Connectors may have bicycle route signs, but do not require special facilities.

Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Map 4.4

Recommended On-road Bicycle Facilities (Inside Urban Loop)

Legend

- Bicycle Lane
- Paved Shoulder
- Sidepath (*1)
- Other On-Road Bicycle Facility (*2)
- Connector (*3)
- Further Study
- Roadway (No Recommendation)
- Colleges
- Schools
- Shopping
- Urban Loop
- Interstate
- Major Roads
- Parks
- Incorporated
- Greensboro MAB
- Lakes

1 Miles

Data Source: City of Greensboro



Recommended Bicycle Facilities		Existing Facilities	
Facility Type	**Miles[1]**	**Facility Type**	**Miles[1]**
Bicycle Lane	131.8	Bicycle Lane	0.6
Paved Shoulder	532.7	Paved Shoulder	29.4
Other on-road bicycle facility[2]	54.3	Other on-road bicycle facility[2]	95.9
Connector[3]	62.0		
Sidepath[4]	27.1		
Further study required	91.0		
Total	**898.9**		**125.9**

[1]Centerline miles (facilities on both sides of the road are not counted separately).

[2]Other on-road bicycle facilities include edgelines, shared pavement markings, and wide outside lanes.

[3]Connectors are shared roadways that provide key bicycle linkages. They may or may not be signed as bicycle routes.

[4]The long-term goal for roads in this category is to provide on-road facilities for bicyclists. However, a sidepath adjacent to the roadway can be acceptable in the short-term when a roadway has high-speed, high-volume traffic and few intersecting roadways and driveways and there is no other option for widening the roadway. Sidepath bikeways in locations with frequent driveways are not a good solution due to conflicts with turning vehicles. If used, these facilities should not be signed as bike routes.

[5]Further study required includes roadways that are important components of the regional bicycle network, but require further analysis to determine the appropriate type of bicycle facility that should be provided. Some of the roadways in this category could be improved through corridor redesign projects. Corridor redesign projects involve reconfiguring the roadway within the existing right-of-way, which may include adding median islands, removing travel lanes, widening sidewalks, and adding bicycle lanes. Other roadways in this category may require additional right-of-way before bicycle facilities can be added.

Table 4(d). Greensboro Urban Area Bicycle Facility Network Recommendations.

B1. Bicycle Lane Requiring Lane Narrowing

Restriping the roadway with narrower travel lanes can provide the roadway width necessary for bicycle lanes. Narrower travel lanes may also help to visually narrow the roadway, causing drivers to reduce their travel speeds slightly. Roadway characteristics such as the speed limit and the percentage of trucks and buses should be evaluated when considering this treatment. In general, lanes should be narrowed to a minimum width of 10 feet; lanes of 11 feet may be necessary for roadways with higher speeds and heavy trucks.

B2. Bicycle Lane Requiring Lane Removal

Removing one (or more) of the existing motor vehicle travel lanes can provide additional space for bicycle lanes (and on-street parking or curb extensions, in some locations). It is important to evaluate potential lane removal projects to understand their impacts on motor vehicle, transit, bicycle, and pedestrian travel.

One type of lane removal project is called a "road diet." This refers to changing a four-lane, undivided cross section into a cross section with one through-lane in each direction, a two-way left-turn lane, and bicycle lanes. This type of treatment can improve (or at least maintain) traffic flow because it removes left-turning traffic from the inside travel lane. While the feasibility of the treatment depends on traffic volume, studies have shown that it does not reduce the capacity of roadways with Average Daily Traffic (ADT) counts of up to 20,000 vehicles per day[1,2]. This type of conversion also has proven benefits in terms of pedestrian, bicycle, and motor vehicle safety[1,2,3]. Pedestrians who are crossing the street would have less motor vehicle lane distance to cross, and median refuge islands could be constructed in the center-turn lane area at appropriate crossing locations (e.g., locations where the center-turn lane would not be used regularly for left-turns and locations with adequate sight-distance between approaching vehicles and the crosswalk).

C. Edgelines/Striped Parking Areas

Edgelines are pavement stripes that narrow the motor vehicle travel lanes to 10- or 11-feet wide and provide a shoulder or a wide striped parking lane that bikes can use. These facilities are used when on-street parking is allowed and there is not enough space to stripe a five-foot wide bicycle lane between moving traffic and the parked vehicles. In addition to providing more space for bicyclists, edgelines may help slow motor vehicle speeds, another factor that improves the Bicycle LOS of a road.

D. Shared Lane Pavement Markings (Sharrow)

Shared lane pavement markings (or "sharrows") can be used to mark bike routes, show the proper direction



for cycling on the road, and provide a visual cue that bikes are welcome on the road. They can be used on roadways where there is not enough space to provide standard width bike lanes. These markings are particularly useful for connecting gaps between other bicycle facilities, such as bike lanes. Because they do not require as much paint, these markings are also less expensive than those for bike lanes. These markings have been used in cities such as Denver, CO, Gainesville, FL, Chicago, IL, and San Francisco, CA. At this time, shared lane pavement markings are an experimental treatment permitted only with the advance permission of the Federal Highway Administration.

E. Striped/Paved Shoulders

Paved shoulder space improves the safety and comfort of bicyclists. There is no minimum width for paved shoulders, however a width of at least 4 feet is preferred. On many roadways, motor vehicle travel lanes can be narrowed to provide more shoulder space. According to the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities (1999), "where 4-foot widths cannot be achieved, any additional shoulder width is better than none at all." Paved shoulders also improve safety for motor vehicles, prevent pavement damage to the travel lanes, and provide space for pedestrians.

The paved shoulder policy from the NCDOT Roadway Design Manual (April 2003 revision) provides minimum paved shoulder widths for new roadways. This policy is summarized in Table 4(e).

The *NCDOT Resurfacing, Restoration, and Rehabilitation (R-R-R) Guide* (April 2004) provides more specific recommendations for shoulders on low-volume roadways. It states that **4-foot paved shoulders should be used on roadways with a current ADT over 3,000 and that 2-foot paved shoulders are recommended on roadways with a current ADT between 1,000 and 3,000**. The guidelines of the NCDOT R-R-R Guide should be followed for low-volume roadways in the Greensboro Urban Area.

Further, while the NCDOT paved shoulder policy suggests that 4-foot paved shoulders *may be considered* on low volume roadways that are bicycle routes, **4-foot (minimum) paved shoulders are strongly recommended on roadways designated as bicycle routes in the Greensboro Urban Area**.

Roadway Type	Design Year Traffic Volumes	Paved Shoulder Width
Interstates and 6-lane freeways	All volumes	10' minimum
4-lane freeways	More than 15,000 ADT	10' minimum
	Less than 15,000 ADT	4' minimum
6-lane arterials and collectors	All volumes	10' minimum
4-lane arterials and collectors	More than 40,000 ADT	10' minimum
	Less than 40,000 ADT	4' minimum
2-lane, 2-way roadways	More than 8,000 ADT	4' minimum
	Between 4,000 and 8,000 ADT	2' minimum
	Less than 4,000 ADT	Full shoulder to be turf
Bicycle routes	Any traffic volume	Consider 4' minimum paved shoulder

Table 4(e) Summary of NCDOT Paved Shoulder Policy (for new roadways). NCDOT Revision Date: April 1, 2003.

F. Shared-Use Paths/Type IV Greenways/Multi-Use Trails (Separated from the roadway right-of-way)

Shared-use paths (also referred to as Greenway paths or multi-use trails) are an important component of a bicycle and pedestrian transportation system. Greensboro has already developed several shared-use paths, including the Latham Park Greenway, Lake Daniel Greenway, and Bicentennial Greenway.



These facilities can provide a high-quality bicycling experience in an environment that is protected from motor traffic because they are constructed in their own corridor, often within an open-space area. Shared-use paths can be paved and should be a minimum of ten feet wide. Minimum width may be reduced to eight feet were physical or right-of-way constraints pose obstacles. Greenway widths of 12-, 14-, and even 16-feet are appropriate in high-use urban situations. Greenway paths that are recommended in this Plan provide important connections that complement on-road bicycle facilities. The Greenway Recommendations section (4.2) discusses these facilities in more detail.

G. Sidepaths (Adjacent to the roadway within the same right-of-way)

This type of path is similar to a multi-use trail, but it is constructed within a roadway corridor right-of-way. Sidepaths can provide a more comfortable place for beginning bicyclists and other people who are not comfortable riding on the road with traffic. Pedestrians also benefit from sidepaths because they serve as wide sidewalks. Sidepaths should not be used to preclude on-road bicycling but rather to supplement other on-road bicycle facilities. Bicyclists retain the right to use the roadway even if the path or trail is adjacent to it unless the roadway is access-controlled.

One critical safety concern with sidepath facilities is conflicts at intersections, particularly between turning motorists and bicyclists riding in the opposite direction as adjacent motor vehicle traffic. Motorists turning right out of a side street or driveway often only look left before turning; they rarely see bicyclists approaching from their right. Therefore, sidepaths are most appropriate in corridors with few driveways and intersections. To encourage bicyclists to ride in the same direction as adjacent traffic, sidepaths should be provided on both sides of roadways, where recommended. Routes where sidepaths are recommended should not be designated as signed bike routes unless adequate on-road bike facilities are provided. Even in locations with sidepaths, the long-term strategy should be to widen the road or narrow the lanes to provide additional space for bicyclists in on-road bike lanes or shoulders.

Figure 4(ww). Sidepath in Rockville, MD.

H. Wide Outside Lanes

Wide outside motor vehicle travel lanes are typically designed to be 14 feet wide. This width allows more separation between bicyclists and motor vehicles than more typical 10- to 12-foot wide travel lanes. However, these travel lanes do not provide the benefit of having a striped area that is exclusively for the use of bicyclists, a feature that bicyclists with all levels of riding experience have reported as desirable. Wide outside lanes also do not have markings to indicate where bicyclists should be positioned when passing through an intersection with a right-turn lane. Wide outside lanes may also make it easier for motorists to travel at higher speeds, which decreases the safety and comfort of pedestrians and bicyclists. Bicycle lanes are preferred to wide outside lanes, and the long-term strategy should be to add bicycle lanes to all roadways that currently have wide outside lanes.



I. Connectors (Shared Roadways/Roadways without Special Bicycle Facilities)

Connectors are shared roadways that provide important linkages to other recommended bicycle facilities or destinations in the region. As shared roadways, these roadways typically have low traffic volumes and/or low speeds, which do not require special bicycle accommodations to be bicycle-friendly. Bicyclists can be served by sharing the travel lanes with motor vehicles. Connectors are typically neighborhood streets in urban areas and quiet rural roads in rural areas. Examples of this type of roadway include Tuscaloosa Street and High Rock Road.

J. Further Study Required

There are several high-speed, high-volume roadways that have poor conditions for bicycling, but do not have straightforward opportunities to stripe narrower lanes, remove lanes, add shoulders, or make other physical improvements due to right-of-way constraints and traffic volumes. These roadways provide important connections between residences and activity locations, as well as good recreational routes, so it is important to accommodate bicycle travel along them in the future. Therefore, further study is needed to identify the appropriate type of future bicycle accommodation.

Some of the roadways in the further study category could be improved through corridor redesign projects. Corridor redesign projects involve reconfiguring the roadway within its existing right-of-way, which may include adding median islands, removing travel lanes, widening sidewalks, and adding bicycle lanes. Corridor redesign projects are intended to improve conditions not only for bicyclists, but also for pedestrians, buses, and motor vehicle traffic. Reconstruction of these corridors will allow for a safer and more efficient use of roadway space in general. While it did not include bicycle lanes, the recent East Market Street reconstruction project is a good example of a corridor redesign project. Other roadways in the further study category may require additional right-of-way before bicycle facilities can be added.

Figure 4(xx). Roadway reconfiguration on E. Market St.

Transitions Between Bicycle Facilities

Different segments of the same roadway may require using different bicycle facilities because of differences in traffic volumes, speeds, roadway widths, and other characteristics. It will be important for the City of Greensboro and NCDOT to provide safe transitions between different facilities (such as transitioning from a bicycle lane to a shared roadway or from a bicycle lane to a shared-use path). These transitions can be made safer and more understandable for bicyclists and motorists with appropriate treatments, such as signs, pavement markings, curb cuts, etc. Transitions should be addressed as a part of the bicycle facility design process.

Bicycling Rights and Responsibilities

The bicycle facilities recommended in this section are intended to improve bicycling conditions on roadways and provide a visible indication that bicycling is a mode that is supported in the Greensboro Urban Area transportation system. However, bicyclists



are not limited to using roadways with designated bicycle facilities. Bicyclists have the legal right under North Carolina law to travel on all roadways other than limited-access roadways. Bicyclists share the same responsibility as drivers to operate safely and respectfully in the roadway environment and obey all traffic laws.

4.3.3 Description of the Bicycle Facility Network

The Greensboro Urban Area Bicycle Facility Network is described in detail in this section. The recommendations in this section will create a safe, efficient, and connected system of high-quality bicycle facilities in roadway corridors throughout the area over the next 20 years. Prioritization of the facility recommendations into Top Priority, Short-Term, Medium-Term, and Long-Term improvements is discussed in the Implementation chapter.

General Characteristics

The Greensboro Urban Area Bicycle Facility Network includes approximately 900 miles of bike routes, paved shoulders, bike lanes, and other on-road facilities. These on-road bicycle facilities will complement the 516-mile system of existing and recommended greenways. This entire network includes both existing and recommended bicycle facilities.

The Bicycle Facility Network is designed to:

- Complement the 516-mile system of existing and recommended greenways;
- Serve and connect existing areas of the greatest population density, employment density, and concentration of activities, as well as areas of expected growth;
- Connect to systems in neighboring MPO's and counties;
- Fill gaps between bicycle facility segments that are currently disconnected;
- Provide access to the transit system;
- Improve or provide key crossings of major highway, river and/or railroad barriers (this includes working with NCDOT on the design of underpasses, overpasses and interchange ramps); and
- Serve parts of the Urban Area with populations that tend to rely on public transit and non-motorized transportation.

The types of bicycle facilities that are recommended are generally related to the intensity of the surrounding development. In Downtown Greensboro and other parts of the region with higher population densities, there are few opportunities to increase roadway width and to do so would often create less desirable pedestrian conditions. In these areas, this Plan recommends reallocating existing roadway space, where appropriate, to accommodate bicycles with facilities such as bicycle lanes, edgelines, and shared lane pavement markings. In contrast, there is space to add new paved shoulders on many rural roads.

4.3.4 Key Corridors in the Bicycle Facility Network

The recommended Bicycle Facility Network covers all parts of the Greensboro Urban Area and is shown in Maps 4.3 and 4.4. The sections below describe how the recommended bicycle facilities will serve the neighborhoods and destinations in the four major parts of the region: Central Greensboro (inside the Urban Loop); East (outside the Urban Loop between US 29 and US 421); South (outside the Urban Loop between US 421 and I-40); and North (outside the Urban Loop between I-40 and US 29). It is important to note that these recommendations are based on current understanding of dynamic conditions. An ongoing review and refinement process will be needed as implementation proceeds in the years ahead.



Central Greensboro (inside the I-840 Urban Loop)
Central Greensboro has the greatest density of population and attractors for bicycle trips (e.g., universities, schools, parks, offices, restaurants, transit stops, etc.) in the urban area. The proposed bicycle facility network in the region will help facilitate bicycle travel between established Greensboro neighborhoods and the Central Business District, as well as making bicycle trips within Central Greensboro more safe and comfortable. Improvements in this area will serve a large number of destinations, including universities, commercial areas, schools, parks, offices, restaurants, and transit stops.

Central Business District

The Central Business District is a key part of Central Greensboro for bicycling because it includes commercial and government office buildings, restaurants, retail, the Depot, First Horizon Park, and many other destinations. The Central Business District serves as the cultural center of the City, and it should be a place where people feel comfortable bicycling and walking. Competing needs in the CBD include motor vehicle, pedestrian, bicycle, and transit traffic flow and on-street parking. Accommodating bicycling downtown should be a priority and will require further study as time passes to continue to assess the changing downtown environment and how to best serve bicycling in the area. In the short-term, the City will pursue shared roadway strategies and speed calming measures to improve conditions for bicycling.

Within the Central Business District, several roadways may be restriped with bicycle lanes. Wide travel lanes may be narrowed to provide space for bicycle lanes on Davie Street, Fisher Avenue, and Washington Street (between Edgeworth Street and Federal Place). Existing travel lanes may be removed on several roadways with excess motor vehicle capacity to make space for bicycle lanes and possibly on-street parking, including Smith Street and McGee Street.

While it is not feasible to add full bicycle lanes on Elm Street, Washington Street (east of Federal Place), and North Greene Street (north of Bellemeade Street), these streets should be maintained as low-speed shared roadway environments. Other treatments should also be used to indicate that these streets are important for bicycling. Bicycle facilities should also be provided on major roadways in the Central Business District when these roadway corridors are reconstructed.

In addition to providing on-road bicycle facilities, the 20 mile per hour speed limit should be enforced in the Central Business District and should be reinforced by engineering measures that make high speeds uncomfortable. Slow motor vehicle speeds are critical for providing a welcoming environment for bicyclists, especially on shared roadways. “Share the Road with Bicycles” signs should be posted within the district as an additional reminder to drivers to be aware of and operate safely around bicyclists. However, these signs should only be used if they do not add to sign clutter in the Central Business District.

The one-way pairs of Market Street and Friendly Avenue (east-west) and Spring Street and Edgeworth Street (north-south) are important roadways because they are continuous for the length of the Central Business District. At this time, these roadways carry high volumes of motor vehicle traffic and require further study for potential bicycle improvements. However, providing bicycle lanes on these main roadways could potentially create the following benefits:

- Provide roadway space for the exclusive use of bicyclists, not shared with motor vehicle traffic.
- Provide critical links in continuous, connected east-west and north-south routes through the



entire City.

- Improve on-street bicycle access to the future Battleground Trail and Downtown Loop Trail.
- Make it possible for people of various levels of bicycle riding experience to feel comfortable bicycling to Downtown destinations.
- Encourage bicyclists to ride on the roadway rather than creating conflicts with pedestrians on the sidewalks.
- Reduce the distance that pedestrians need to cross motor vehicle lanes, which decreases pedestrian exposure to potential crashes.
- Create new on-street parking spaces on several blocks (if an existing travel lane is converted to a bicycle lane and on-street parking area).

Therefore, further study should examine the possibility of adding one-way bicycle lanes on both of these one-way roadway pairs. This analysis should explore the possibility of making space for a five-foot bicycle lane on Spring and Edgeworth Streets by removing one travel lane on each roadway. This could also have the additional benefit of providing enough space for new on-street parking on several blocks. Two different approaches should be examined for providing bicycle lanes on Market Street and Friendly Avenue. Between East Lake Drive and Eugene Street, it may be possible to create space for a bicycle lane on both of these one-way streets by removing one of the existing travel lanes (this may also provide enough space to add new on-street parking on several blocks)[4]. Between Eugene Street and Murrow Boulevard, the existing travel lanes could be narrowed to 10 feet on both streets (without requiring lanes to be removed), which would leave enough space for a five-foot bicycle lane adjacent to the on-street parking.

Since traffic must not exceed 20 miles per hour by law, 10-foot-wide lanes may help to reinforce lower speeds. The recommended bicycle improvements in the Central Business District will provide access to other bicycle facilities within the Central Business District and surrounding neighborhoods. This includes connections to the Battleground Trail, Downtown Loop Trail and to bicycle facilities on North Elm Street, Church Street, Lindsay Street, Washington Street, South Elm Street, and Spring Garden Street.

Northeast Neighborhoods

On the northeast side of Greensboro, bicycle facilities should provide access to key bicycle trip attractors, such as NC A&T State University, Greensboro Technical Community College (GTCC), Moses Cone Memorial Hospital, the State Street commercial area, shopping centers at the interchange of US 29 and Cone Boulevard, Keeley Park, and to the incorporated and unincorporated areas beyond.

Bicycle facilities should be provided to serve the NC A&T campus. These facilities include bicycle lanes on Lindsay Street, Yanceyville Road, and Benbow Road (north of Bluford Street). The Benbow Road bicycle lanes should be connected with the neighborhood south of campus with shared lane pavement markings. Sullivan Street should be marked with edgelines through the campus area and be connected to the neighborhood west of campus with shared lane pavement markings. Currently, bicyclists can use the sidewalks and share the roadway with vehicles on East Market Street on the south side of campus. In the long term, the City should look for opportunities to provide additional on-road bicycle accommodations to East Market Street and increase the safety of bicyclists who use the sidewalks (e.g., add markings and signs to indicate the proper direction of travel and provide warnings at intersections and driveways).

Bicycle access to GTCC Wendover Campus should be improved by adding edgelines to Phillips Avenue and Huffine Mill Road (north of Wendover Avenue). New



bicycle lanes and edgelines on Bessemer Avenue and new bicycle lanes on Burlington Road will also help improve bicycle connectivity to GTCC. On-road bicycle accommodations should also be provided when East Market Street is reconstructed—this would help create a direct connection between NC A&T and GTCC. Finally, a bicycle route should be signed to show the preferred route to GTCC from the northeast Greensboro neighborhoods.

Bicycle lanes should be provided on Church Street to connect the Central Business District with Moses Cone Memorial Hospital, the Keeley Park Connector Greenway, and neighborhoods to the north. The Church Street bicycle lanes should connect to shared lane pavement marking and edgeline facilities on Golden Gate Drive to facilitate bicycle access to the State Street commercial area. Church Street should be constructed with edgelines between Cone Boulevard and Lee's Chapel Road (on-street parking should be striped on the west side of the street, and a shoulder should be striped on the east side of the street). Further study should be undertaken to determine the type of bicycle accommodations on North Elm Street (north of Fisher Avenue) and Yanceyville Road (north of Bessemer Avenue). Multimodal access, traffic congestion, and neighborhood character are all important issues that will need to be weighed when determining the future design of North Elm Street. It may be possible to remove one of the travel lanes on Yanceyville Road to create a three-lane cross section with bicycle lanes, though this may increase motor vehicle traffic congestion to an unacceptable level. Both Elm Street and Yanceyville Road should have bicycle lanes on their southern sections approaching the Central Business District.

Keeley Park is served by the Northeast Community Trail, but the new shoulders on Rankin Mill Road and Huffine Mill Road should also provide bicycle access to the park from the roadway system.

The commercial areas in the Bessemer Avenue/ Wendover Avenue corridor should be served by a combination of bicycle lanes and edgelines on Bessemer Avenue. Further study will be needed to identify additional opportunities for improving bicycle conditions on Wendover Avenue.

There are several other key roadways for bicycle facilities in the northeast Greensboro neighborhoods. Bicycle lanes should be striped on Summit Avenue (between McKnight Mill Road and Brightwood School Road), Rankin Road, Cone Boulevard, 16th Street, Cornwallis Drive (east of Elm Street), English Street, and Holts Chapel Road (west of Franklin Boulevard). **Bicycle lanes should be provided on all new bridges and underpasses crossing the Urban Loop**, including Elm Street, Church Street, Yanceyville Road, McKnight Mill Road, East Cone Boulevard, and Huffine Mill Road. It is critical to take advantage of the opportunity to provide bicycle lanes during bridge construction because the structures will likely be in place for at least 50 years. Edgelines should be added to Church Street (between Cone Boulevard and Lee's Chapel Road), Textile Drive, Gatewood Avenue, and Holts Chapel Road (between Franklin Boulevard and Ward Road). Shoulders should be constructed on Brightwood School Road, McKnight Mill Road, Franklin Boulevard, and JFH Dairy Road. Franklin Boulevard is currently under construction and should be modified in the future to provide better bicycle accommodations.

The US 29 access roads may provide an opportunity to facilitate bicycling in this highway corridor. A continuous bicycle route could be developed on either side of the highway by linking gaps in the access roads with shared-use path connectors.



Southeast Neighborhoods

Bicycle facilities in southeast Greensboro should provide access to important destinations, such as Bennett College, Barber Park, Gillespie Park, Interstate Industrial Park, Kindred Hospital, and the proposed UNC-G and NC A&T Joint Millennium Campus. The bicycle facility network should also serve neighborhood homes, schools, parks, shopping, and both incorporated and unincorporated areas beyond.

Several bicycle facilities should be provided to improve bicycle access to Bennett College. Edgelines should be striped on Washington Street on the north side of campus, and the travel lanes on Lee Street should be narrowed to provide bicycle lanes on the south side of campus. Bennett Street should be converted from four lanes to two lanes with a center turn lane and bicycle lanes (between Lee Street and Florida Street). This will improve bicycle access to the southeast side of campus. Further study will be needed to determine the type of bicycle facilities that should be added to Bennett Street between Lee Street and Market Street.

On-road bicycling conditions should be improved in the area near Barber Park and the proposed Joint Millennium Campus. These improvements include edgelines on Willow Road and new shoulders on McConnell Road. Edgelines should be striped on Florida Street to connect Barber Park with Gillespie Park.

In the Gillespie Park area, edgelines should be added to Florida Street between Martin Luther King, Jr. Drive and Randleman Road. Randolph Avenue is an important connector roadway on the west side of Gillespie Park. It should connect with new shoulders on Patton Avenue.

Bicycle lanes should be added to Industrial Avenue and shoulders should be constructed on Pleasant Garden Road to provide connections to the Interstate Industrial Park Area.

The Interstate 40 bridges and underpasses should all be improved to accommodate bicyclists. Shoulders should be provided on Lee Street (NC 6), Youngs Mill Road, and McConnell Road. Bicycle lanes should be striped on Martin Luther King, Jr. Drive and South Elm-Eugene Street between Florida Street and Interstate 40. Bicycle facilities should be included on all of the roadways that cross Interstate 85, including shoulders on McConnell Road, Youngs Mill Road, Wiley Lewis Road, Pleasant Garden Road, and South Elm-Eugene Street between Interstate 85 and Randleman Road.

Figure 4(yy). Restriping opportunity on S. Elm/Eugene Street.

Other roadways in southeast Greensboro should also include bicycle facilities. Bicycle lanes should be included on Alamance Church Road and Vandalia Road (East of South Elm-Eugene Street) when these roadways are reconstructed. Shoulders should be provided on Sharpe Road, Wiley Lewis Road, and Webster Road. Edgelines should be added to Montcastle Drive, and shared lane pavement markings should be added to Oxford Street (south of Florida Avenue). Several roads should also serve as shared



roadway connectors to provide bicycle access within the neighborhoods of southeast Greensboro, including Benbow Road, Tuscaloosa Street, and English Street (south of Washington Street).

Southwest Neighborhoods

On the southwest side of Greensboro, bicycle facilities should provide access to key bicycle trip attractors, such as the UNC-G campus, Greensboro College, Greensboro Coliseum, Lindley Park, Four Seasons Towne Centre, Wendover Place Shopping Center, Landmark Shopping Center, other retail stores in the High Point Road, Wendover Avenue, and Market Street commercial corridors, and both unincorporated and incorporated areas beyond.

Many students and campus employees commute by bicycle to the UNC-G campus. Therefore, bicycle facilities should connect to all sides of the campus. Bicycle lanes will be striped on Spring Garden Street (project underway) to connect the south side of UNC-G with the Central Business District and the new Battleground Rail Trail. Two blocks of Spring Garden Street (between Tate and Mendenhall Streets) are recommended for shared lane pavement markings because there is not enough space for bicycle lanes. The Federal Highway Administration (FHWA) approval of this treatment is required. This will involve an experimental research study of the effectiveness of the shared lane pavement markings. Further study should be undertaken to evaluate the possibility of bicycle lanes on West Market Street and West Friendly Avenue to provide a connection between the north side of UNC-G, the Arboretum area, and the Central Business District. Tate Street should include shared lane pavement markings for bicyclists on the east side of campus. Aycock Street and Lee Street should both be redesigned to include bicycle facilities as well as improved pedestrian crossings. On the west side of campus, Walker Avenue is an excellent shared roadway connector that currently serves many bicyclists. This roadway should be considered for a bicycle boulevard treatment. Walker Avenue could be developed into a bicycle boulevard by removing the stop signs at intersections with neighborhood streets and adding traffic calming treatments such as diverters, traffic circles, raised crosswalks, and chicanes. This would allow bicyclists to travel the length of the street without being required to stop (except at major intersections, such as Holden Road and Aycock Street). The traffic calming measures would help prevent drivers from speeding on Walker Avenue. Signs and markings should also be provided to indicate that priority should be given to bicyclists and pedestrians using the street.

The neighborhood south of the Central Business District and UNC-G is separated from the campus and downtown area by railroad tracks. A connection across the tracks should be provided by adding a sidepath on Freeman Mill Road. This path would provide access to McGee Street, which connects to the Central Business District. Other railroad crossings should be improved at Chapman Street and at Aycock Street and Tate Street to provide connectivity to the campus area. Bicycle facility improvements on Aycock Street and Coliseum Boulevard are recommended, but will require further study.

Bicycle lane, edgeline, and shared lane pavement marking facilities should be provided on Florida Street to provide east-west access through the neighborhoods of south Greensboro. Meadowview Road should also have edgelines to serve as a parallel route further south. This roadway also provides access to the existing and proposed sections of the Hillsdale Greenway.

High Point Road should be reconstructed to accommodate motor vehicle, bus, pedestrian, and



bicycle transportation. To make these improvements, it will be necessary to consider completely reconstructing the roadway within its existing right-of-way so that it includes a raised median, sidewalks, marked crosswalks, and bicycle lanes. This long-term project would likely require removing an existing motor vehicle travel lane. Bicycle access to this corridor should be provided by striping edgelines on Florida Street and Vanstory Street, marking bicycle lanes on Meadowview Road and Holden Road, and constructing sidepaths on Pinecroft Road.

Wendover Avenue should also be a corridor redesign project. This roadway serves high-speed, high-volume traffic, but it also provides access to the Wendover Place and Landmark Station Shopping centers. Future roadway reconstruction in this corridor should facilitate the safe and efficient movement of motor vehicles, transit, pedestrians, and bicyclists.

Bicycle lanes should be provided on West Market Street between NC 68 and Guilford College Road. West Market Street between Guilford College Road and Muirs Chapel Road should be redesigned to accommodate all modes, including bicycle transportation. Further study is needed to assess the type of bicycle accommodation for Market Street between Wendover Avenue and Aycock Street.

Many of the existing Interstate 40 crossings in southwest Greensboro are barriers to bicycling. The best crossing locations are currently on Vanstory Street and Guilford College Road. Future reconstruction projects on Randleman Road, High Point Road, and Wendover Avenue should all facilitate safe bicycle access across the interstate interchanges. Further study will be needed to provide bicycle facilities to cross Interstate 40 on Merritt Drive and Holden Road.

Bicycle facilities should be included on all of the roadways that cross Interstate 85, Business 85, and the Urban Loop to help maintain bicycle access between Greensboro and High Point. Bicycle lanes should be constructed on Vandalia Road, Groometown Road, High Point Road (on both the existing and new alignment), Hilltop Road, Bridford Parkway, Wendover Avenue, Guilford College Road, and West Market Street. The existing shoulders on Wiley Davis Road should be extended over the freeway, and shoulders should be added to Burnt Poplar Road, Holden Road, Rehobeth Church Road, and Randleman Road.

Other roadways in southwest Greensboro should also be improved for bicycling. Bicycle lanes should be added to Vandalia Road (between Holden Road and South Elm-Eugene Street), Glendale Drive (west of Rehobeth Church Road), Stanley Road (south of Koger Road), Swing Road, and Fairfax Road. Edgelines should be added to much of Pinecroft Road (south of Vanstory Street), Rehobeth Church Road (between Creekridge Road and Glendale Drive), Glendale Drive (east of Rehobeth Church Road), and Meadowood Street.

Several other roadways are important bicycle connections but require further study before appropriate accommodations can be recommended. These roadways include Merritt Drive, Muirs Chapel Road, and Holden Road (between Spring Garden Street and High Point Road). Roadways requiring further study often have high traffic volumes (no excess roadway capacity), lack additional travel lane width to restripe for bicycle lanes, and lack additional right-of-way width for widening curbs or adding shoulders.

Northwest Neighborhoods

The neighborhoods on the northwest side of Greensboro include important bicycling destinations such as Guilford College, the Battleground Avenue



Commercial Corridor, Guilford County Courthouse National Military Park, Friendly Center Shopping Center, Lake Daniel Park, Latham Park, Buffalo Lake, Bicentennial Greenway, and both unincorporated and incorporated areas beyond.

Figure 4(zz). Potential for edgelines along Hobbs Rd.

West Friendly Avenue, College Road, and New Garden Road are important roadways for improving access to Guilford College. West Friendly Avenue (west of Jefferson Road) and New Garden Road (between College Road and Bryan Boulevard) should be restriped to provide space for bicycle lanes. Sidepaths should be provided, where possible, on both sides of College Road on the west side of campus (from New Garden Road south to the future Urban Loop) in locations where sidewalks do not exist. In the future, on-road accommodations should also be provided on College Road. When the sidepath facilities are added, they should include signs and markings that indicate the proper direction of travel and for bicyclists to use caution at intersection and driveway crossings. Edgelines should be added to Hobbs Road on the north side of campus, Jefferson Road on the east side of campus, and Dolley Madison Road on the south side of campus. Access from the Bicentennial Trail and neighborhoods to the west of Guilford College should be provided by new shoulders on Ballinger Road. Further study will be needed to determine if bicycle facilities can be provided south of campus on Muirs Chapel Road. One possibility could be to reduce the four-lane undivided roadway to one lane in each direction with a center turn lane and bicycle lanes. However, this configuration may cause an unacceptable level of motor vehicle traffic congestion.

Bicycle lanes are recommended on Westridge Road to provide connectivity between Guilford College and the Guilford Courthouse National Military Park. This would require restriping existing pavement and coordinating this work with an intersection improvement project at the intersection of Battleground Avenue and Westridge Road. The recommended bicycle lanes (between West Friendly Avenue and Battleground Avenue) on New Garden Road should also connect the College with the National Military Park. Bicycle access to the park could also be improved by adding bicycle lanes to Battleground Avenue between Westridge Road and Old Battleground Road when it is reconstructed. Bicycle facilities should also be provided on Lake Jeanette Road as a part of an upcoming reconstruction project.

Bicyclists will be able to travel along the Battleground Avenue commercial corridor on the new Battleground Rail Trail. However, several roadways should be improved to provide access from surrounding neighborhoods to the trail and commercial establishments in the Battleground Avenue corridor. In addition to the New Garden Road wide outside lanes and Westridge Road bicycle lanes, bicycle lanes should be added to Green Valley Road and Cone Boulevard. Edgelines should be provided on Cornwallis Drive, and a shared roadway connector should provide access to the corridor using Sunset Drive, Dellwood Drive, and



Isaacs Place.

Figure 4(aaa). Recommended connector on Sunset Dr.

Travel lanes should be narrowed on Pisgah Church Road to provide a wide outside travel lane (sidepaths are not recommended because many parts of the corridor already have or will soon have 5-foot sidewalks). Bicycle lanes should be provided on Willoughby Boulevard to serve the neighborhoods near Buffalo Lake. However, further study will be needed to determine how to accommodate bicycle travel on Lawndale Drive, Martinsville Road, and David Caldwell Drive. The possibility of a bicycle boulevard could be considered as one of a range of possible strategies to calm cut-through traffic and improve bicycle access on David Caldwell Drive.

Bicycle lanes on Cone Boulevard and Holden Road should be provided to improve bicycle access along a five-mile arc between Buffalo Lake and the Lake Daniel Park and Latham Park area (though the section of Holden Road between Bryan Boulevard and Cone Boulevard requires further study). Since these roadways have higher speeds (posted speed limits between 35 and 45 miles per hour), it will be important to provide special high-visibility markings to delineate the bicycle lanes.

West Friendly Avenue is an important roadway for providing bicycle connectivity from neighborhoods on the west side of Greensboro to the Friendly Center Shopping Center, Wesley Long Community Hospital, Lake Daniel Park, UNC-G, and the Central Business District. The existing roadway lanes should be narrowed to provide bicycle lanes on West Friendly Avenue between West Market Street and Jefferson Road. However, further study will be needed to determine how to accommodate bicyclists on Friendly Avenue between Jefferson Road and the UNC-G campus, including the challenging crossing under Wendover Avenue.

In the short term, bicycle access between the Guilford College area and UNC-G will be provided by roadways parallel to West Friendly Avenue. The edgelines on Hobbs Road will be a parallel alternative on the north side; shared roadway connector routes on Madison Avenue, Kemp Road, and Starmount Drive are parallel alternatives on the south side. Shared roadways can also provide a second alternative route on the south side of West Friendly Avenue. Bicyclists can travel from College Road on the south side of Guilford College all the way to the UNC-G campus using Tower Road, Staunton Drive, and Walker Avenue. A critical gap in this route is the connection between Staunton Drive and Walker Avenue across Market Street. Further study is needed to provide bicycle access through this gap.

Bicycle facilities should be included on all of the roadways that cross the Urban Loop. These facilities include bicycle lanes on West Friendly Avenue, Lewiston Road, Horse Pen Creek Road, Drawbridge Parkway, Battleground Avenue and Old Battleground Road and shoulders on Ballinger Road, Old Oak Ridge



Road, and Fleming Road. Bryan Boulevard is also a barrier to bicycle travel, so the crossings provided by Fleming Road, New Garden Road, Westridge Road, Holden Road should all include bicycle lanes. The Jefferson Road underpass should continue to be striped with edgelines.

East (outside the Urban Loop between US 29 and US 421)

The eastern part of the Greensboro Urban Area includes the Town of Sedalia, developments in the Reedy Fork area near US 29, neighborhoods northeast of Pleasant Garden, rural homes, farms, Northeast Park, and ten county schools.

Several new roadways should help provide access to developments near Reedy Fork and US 29. The Reedy Fork Parkway and Turner Smith Road extension should both include bicycle lanes. Existing roadways in this developing part of Guilford County should be reconstructed with paved shoulders, including McLeansville Road, Friendship Church Road, and High Rock Road, all of which would make it safer for bicyclists to connect to the Bryan Alamance Greenway Trail. New shoulders on Hicone Road should improve access to Northeast Guilford Middle and High Schools. Eckerson Road, Rankin Mill Road, and Turner Smith Road should also be reconstructed with paved shoulders.

Huffine Mill Road and High Rock Road should both include shoulders to provide better accommodations for bicyclists riding to Northeast Park. Other roadways north of Sedalia should also have shoulders, including Frieden Church Road, Harvest Road, Cullen Road, Knox Road, and Birch Creek Road. New shoulders on Carmon Road and Bethel Church Road should help accommodate bicyclists riding between Sedalia and Gibsonville.

Eastern Guilford Middle and High School should be served by the shoulders on Bethel Church Road as well as new shoulders on Sedalia Road. The historic center of Sedalia should be served by both on-road and off-road bicycle facilities. Shoulders should be added to US 70, and a shared use path should also be constructed beside US 70 between Sedalia Elementary School and the Stoney Creek Village Shopping Center. This pathway would provide access for bicyclists who do not feel comfortable riding on the roadway, pedestrians, and other non-motorized users.

Figure 4(bbb). New shoulders on Hicone Rd.

South of Sedalia, shoulders should be added to Mount Hope Church Road, Millstream Road, McConnell Road, Millpoint Road, and Rock Creek Dairy Road. The upcoming bridge replacement project on McConnell Road will be wide enough to include shoulders.

Several of the roadways with shoulders would improve bicycle connectivity with Alamance County, including Osceola-Ossipee Road, Shoe Road, Holts Store Road, NC 62, and Alamance Church Road.

In the areas around Southeast Guilford High School, most main roadways should be reconstructed with



shoulders. These roads include Southeast School Road, Williams Dairy Road, Alamance Church Road, Woody Mill Road, Monnett Road and Thacker Dairy Road. The roads in the neighborhoods northwest of the school, such as Lynwood Lakes and Forest Oaks, should also be retrofitted to include sidewalks.

To the south, the community of Julian should be served by shoulders on Liberty Road and Folger Road. These facilities will also help improve bicycling connections into Randolph County.

The main North Carolina state highways in eastern Guilford County (NC 150, NC 61, and NC 62) should all be reconstructed with shoulders. This will help provide designated space for bicyclists on these roadways with higher traffic volumes and more heavy trucks.

South (outside the Urban Loop between US 421 and I-40)

Key destinations for bicycling in the southern part of the Urban area include the Town of Pleasant Garden, the community of Sedgefield, Hagan Stone Park, Southwest Park, and the recommended Hickory Creek Trail.

Pleasant Garden should be served by new paved shoulders on Pleasant Garden Road, Hunt Road, Ritters Lake Road, Spur Road, Neelley Road, and Alliance Church Road (between Neelley Road and Appomattox Road). Bicycle and pedestrian access to Hagan Stone Park should be provided by shared use paths and shoulders on Appomattox Road and Hagan Stone Park Road. Further, shoulders should be provided on Tabernacle Church Road, and this roadway should be connected to Hagan Stone Park with a new shared use path on the north side of the park.

The Sedgefield area includes many residential developments, and it will be served by bicycle lanes on Mackay Road, the existing sidepath on Adams Farm Parkway, and shoulders on Wayne Road and Alamance Road.

It is critical to provide bicycle facility connections between the southwestern part of the Greensboro Urban Area to the City of High Point Urban Area. Bicycle access will be provided to the northeast side of High Point with bicycle lanes on Gallimore Dairy Road, shoulders on Boulder Road and Chimney Rock Road, and with a combination of shoulders and bicycle lanes on Guilford College Road. In the Sedgefield area, these connections will be provided by new bicycle lanes on High Point Road when it is realigned, the existing shoulders on Wiley Davis Road, and new bicycle lanes on Grandover Parkway. Shoulders on Groometown Road, Kivett Drive, Burnetts Chapel Road, and NC 62 will provide bicycle access to Southwest Park, the recommended Hickory Creek Trail, and the east side of High Point.

Shoulders should be provided on many other roadways in southern Guilford County, including Bishop Road, Kivett Drive, Drake Road, Old Randleman Road, Randleman Road, and Company Mill Road. New shoulders on Groometown Road, Coltrane Mill Road, Branson Mill Road, and NC 22 will improve bicycle access to Randolph County.

North (outside the Urban Loop between I-40 and US 29)

Much of the development that has occurred in the Urban Area outside of the City of Greensboro has occurred in Northwest Guilford County. This part of the region includes many important bicycle destinations. The area near Piedmont Triad International (PTI) Airport is undergoing rapid commercial, industrial, and residential development. Stokesdale, Oak Ridge, and Summerfield have small historic village centers



and newer, low-density residential developments. Northern Greensboro also includes an extensive trail and greenway system around Lake Higgins, Lake Brandt, Lake Jeanette, and Lake Townsend as well as Bur-Mil Park and Bryan Park. Many of the roadways in the northwest part of the region were previously low volume, narrow, two-lane country roads, but now they carry much more traffic and are much less comfortable for bicycling. Paved shoulders are a key recommendation for many roadways in this area.

US 220, US 158, NC 150, and NC 68 are major highways that provide long-distance connections between communities in this part of the region. Most sections of these highways carry high volumes of traffic, including many heavy trucks, and currently lack paved shoulders. **As these roadways are reconstructed, it will be essential to provide shoulders or bicycle lanes to accommodate bicyclists.**

The PTI Airport area developments should be served by bicycle lanes on West Market Street, West Friendly Avenue, and Gallimore Dairy Road. Shoulders on Old Oak Ridge Road and Chimney Rock Road should provide access to development on the north and east sides of the airport. On the west side of the airport, sidepaths should be provided when the NC 68/Airport Connector is constructed.

Triad Park and the south side of Oak Ridge should be served by shoulders on Bunker Hill Road, West Market Street, Beeson Road, and County Line Road. Bicycle lanes should be provided on West Market Street. However, wide outside lanes may be provided in the short term when West Market Street is reconstructed. These bicycle facilities will make it safer and more convenient for bicyclists to access the Piedmont Greenway, which will pass through the Triad Park and continue northeast to Lake Higgins and Lake Brandt.

In the Oak Ridge area, paved shoulders should be provided on the major highways of NC 68 and NC 150, as well as Stafford Mill Road, Alcorn Road, Edgefield Road, Fleming Road, Pleasant Ridge Road, and Bunch Road.

Figure 4(ccc). Facilities within Triad Park make it an important trip attractor for bicyclists to access.

Shoulders should be added to several roadways in Stokesdale, including Haw River Road, Eversfield Road, Belews Creek Road (NC 65), Athens Road, and the new US 158 Stokesdale Bypass. Southard Road should include shoulders to provide improved bicycle connectivity into Rockingham County. The shoulders on NC 65, NC 68, US 158, Lake Brandt Road, Scalesville Road, and Church Street will also be new bicycle facility connections into Rockingham County.

Oak Ridge Road, US 158, and Belews Creek Road (NC 65) are recommended to include shoulders that connect with bicycle facilities in Forsyth County. The recommended bicycle lanes on West Market Street will enhance bicycling connections in the airport area and into Forsyth County.

In the Summerfield area, bicycle conditions should be

improved by adding shoulders to Scalesville Road, Brookbank Road, Pleasant Ridge Road, Summerfield Road, Strawberry Road, and Witty Road.

The greenway system around Lake Higgins, Lake Brandt, Lake Jeanette, and Lake Townsend is a popular destination for bicyclists. Bur-Mill Park and Bryan Park are also in this area. Many of the roadways in this area are narrow, two-lane roadways that serve high traffic volumes because there are few alternative routes for traffic. Adding shoulders to roadways in this area will improve conditions for bicycling, making the lakes area more accessible to bicyclists of all abilities, not only bicyclists who feel comfortable riding in travel lanes with motor vehicle traffic. Roadways that should have paved shoulders in this area include Lewiston Road, Carlson Dairy Road, Battleground Avenue, Lake Brandt Road, Air Harbor Road, Plainfield Road, Church Street, Archergate Road, Yanceyville Road, Doggett Road, Brown Summit Road, Townsend Road, and Bryan Park Road.

4.3.5 Signed Bicycle Route System

A system of signed bicycle routes is also recommended for the Greensboro Urban Area (see Map 4.5, Recommended Signed Bicycle Routes). Signed bicycle routes are roadways that are designated as official bicycle routes with "BICYCLE ROUTE" signs. Bicycle route signs can be posted on roadways or greenways and used in combination with any other type of bicycle facility (e.g., the same signed bicycle route may use low-volume neighborhood streets, roadway segments with bicycle lanes or edgelines, and a shared-use path adjacent to a creek).

The recommended 27.3 miles of signed bicycle routes in Greensboro are intended to show residents the most suitable roadways to use for bicycling between Downtown Greensboro and neighborhoods on each side of the City (and between Barber Park and Four Seasons Mall). These routes were selected in order to provide a reasonable level of comfort for all types of cyclists, including people who do not ride often or who are beginners. Therefore, roadways that received Bicycle LOS grades of "D", "E", and "F" were avoided. Though nearly all of the roadway segments recommended as bicycle routes have above average suitability, there are several locations on these routes that require spot improvements (e.g., busy road crossings, bridge crossings, turn lanes, etc.). The City should establish a funding source for and make spot improvements before these routes are signed for use by the general public.

The signed bicycle routes recommended in this Plan are Top Priority projects. The bicycle routes should be signed within the first two years after this Plan is adopted. These routes will also be shown on the public bicycle map that is being developed as a part of this Plan.

The recommended bicycle route system will replace the existing signed bicycle route system in Greensboro, which was established in the early 1990s. Roadways in the existing system were not selected using an objective suitability analysis and did not provide direct routes between important destinations in Greensboro.

During the public input process, citizens highlighted the importance of having bicycle routes that serve all communities in Guilford County and connect to routes in adjacent counties (including providing a route for the North Carolina Mountains to Sea Trail). A more extensive network of signed bicycle routes is not recommended in the short-term because the bicycle conditions on many of the roads in Guilford County outside of the City of Greensboro currently provide a below-average comfort level (Bicycle LOS "D", "E", or "F") for all types of cyclists (often due to narrow travel lanes, moderate to high traffic volumes, and a lack of



paved shoulders).

Future bicycle facility improvements, such as additional paved shoulders, will improve the suitability of roadways and allow the bicycle routes to be extended further from the central part of Greensboro. These routes should eventually connect Greensboro with routes in adjacent counties. Signing future bicycle routes is dependent on making improvements to roadways that are not currently suitable for typical bicyclists.

To promote connectivity between the City of Greensboro and adjacent jurisdictions, several roadway corridors have been selected as potential future routes (see Map 4.5, Recommended Signed Bicycle Routes). Roadways that could potentially be used for expanding the recommended system of signed bicycle routes should be re-evaluated when this plan is updated in five years in order to take advantage of some of the bicycle facility improvements that will result from this plan. The selection of additional roadways to sign in five years should utilize the experience that the City will gain from signing the initial 27.3 miles of routes. Note that the potential future routes should not be signed until bicycling conditions are improved.

4.3.6 Ancillary Supportive Bicycle Facilities

Bicycle racks and bicycle lockers

Secure bicycle parking located close to building entrances and transit entry points can make bicycling more attractive to potential cyclists. It also reduces the risk of bicycle damage or theft. Bike rack design and site location are discussed in the Bicycle Parking Guidelines, developed by the Association of Pedestrian and Bicycle Professionals. Bike lockers provide added protection from theft and weather. Bike parking is important at key bicycling destinations such as parks, shopping centers, schools, town centers, historic sites, transit stations and park-and-ride lots. It is also good to have bike parking available near business entrances and at employment sites. The Greensboro MPO should conduct a study to identify locations for bicycle parking improvements.

Bike-friendly traffic signals

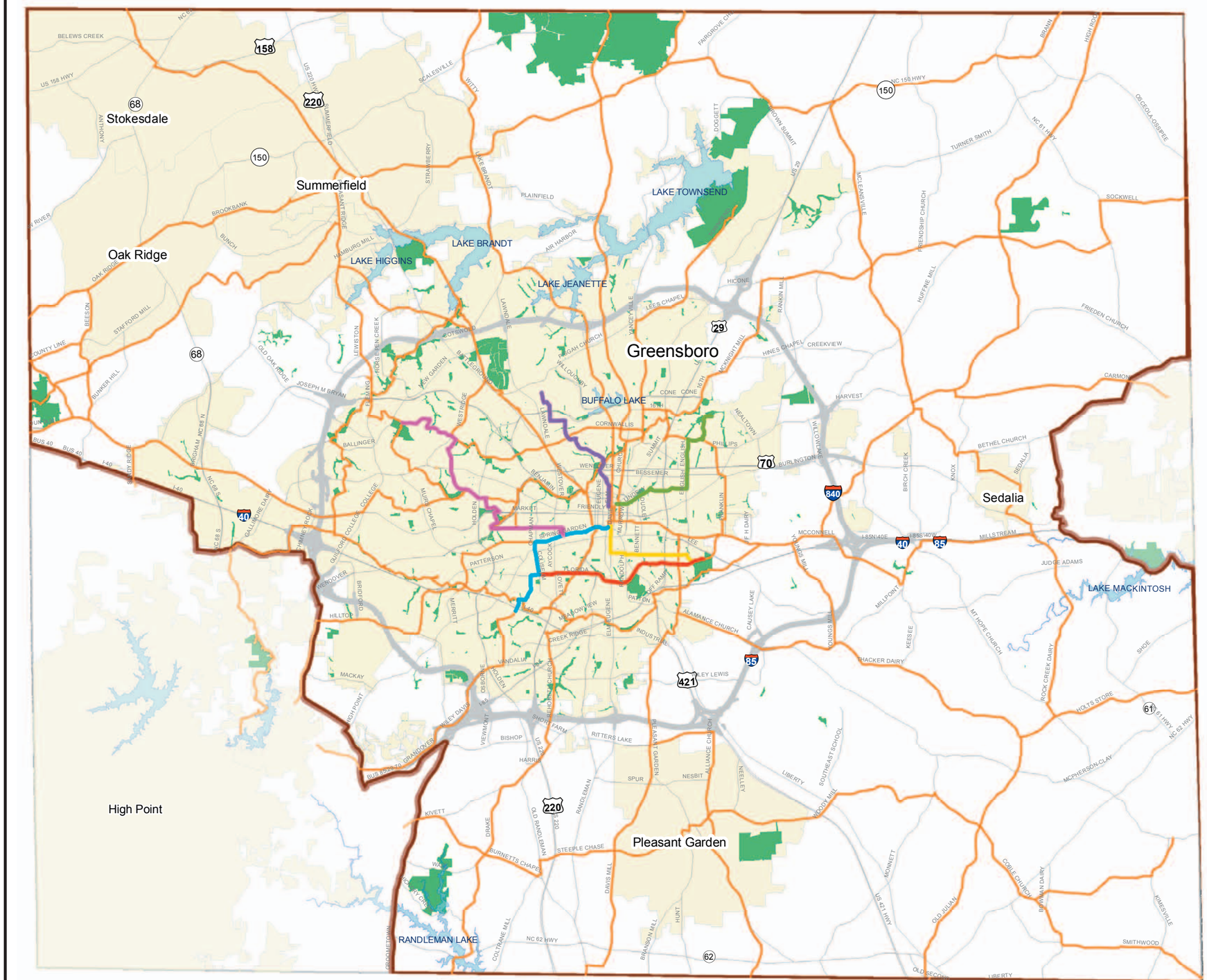
There are a variety of ways to make traffic signals more suitable for bicyclists. These treatments include changing signal timing so that bicyclists are able to clear intersections during yellow, providing minimum green time, and installing improved detection equipment (e.g., loop detectors or video camera detection for bicycles at signalized intersections that require vehicles to be present to change the signal).

High-visibility "Share the Road" bicycle warning signs

Advance warning signs can be posted to make drivers more aware of trail and other key bike route crossings. North Carolina has been using "Share the Road" signs on roadways since 1974. These signs should be used on selected roadways in the Greensboro Urban Area to increase awareness of bicyclists, especially in areas where bicyclists may not be expected or where many drivers are tourists. A new fluorescent yellow/green color has been is approved in the national Manual on Uniform Traffic Control Devices (MUTCD) and can be used on these signs. Signs should be used judiciously—too many signs can cause visual clutter and lead to non-compliance.

Bike-friendly traffic calming

Slowing motor vehicle speeds helps improve the Bicycle LOS of a road. Striping narrower lanes may help slow motor vehicles, and it can also create more space on the road for bicyclists. Traffic circles, curb extensions, and medians are other examples of facilities that can be added to a roadway to slow motor vehicles. These facilities also improve the safety and comfort of pedestrians. Additional discussion of traffic



Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Map 4.5

Recommended Signed Bicycle Routes

Legend

Signed Bicycle Routes (*1)

- Barber Park to Four Seasons Mall
- Downtown to Barber Park
- Downtown to Bywood Park
- Downtown to Four Seasons Mall
- Downtown to Jefferson ES
- Downtown to Joyner ES
- Potential Long-term Routes
- Urban Loop
- Parks
- Incorporated
- Greensboro MAB
- Lakes

(*1) Signed bicycle routes are recommended on roadways that have a Bicycle LOS grade of A, B, or C (above average bicycle suitability), including some short sections of roadway that can be mproved to have above average suitability in the short-term

1 Miles

Data Source: City of Greensboro



calming is included in Appendix C.

(Endnotes for 4.3)

[1]Huang, H.F., Stewart, J.R., and Zegeer, C.V. "Evaluation of lane reduction "road diet" measures on crashes and injuries", *Transportation Research Record*, No. 1784, TRB, National Research Council, Washington, D.C., pp. 80-90, 2002.

[2]Huang, H.F., Stewart, J.R., and Zegeer, C.V. "Evaluation of Lane Reduction "Road Diet" Measures and Their Effects on Crashes and Injuries," Highway Safety Information System (HSIS) Summary, Publication HSIS FHWA-HRT-04-082, http://www.hsisinfo.org/pdf/04-082.htm, 2004. Accessed December 2005.

[3]Pawlovich, M., W. Li, A. Carriquiry, and T. Welch. "Iowa's Experience with 'Road Diet' Measures: Impacts on Crash Frequencies and Crash Rates Assessed Following a Bayesian Approach", Submitted for review to *Transportation Research Record*, http://www.dot.state.ia.us/crashanalysis/pdfs/trb_roaddiet_papersubmission_08012005.pdf. Accessed December 2005.

[4]Engineering analysis is necessary before travel lanes can be removed. The lane removal should not create unacceptable levels of traffic congestion or hazardous conditions for motor vehicle, bus, bicycle or pedestrian movements.



4.4 Pedestrian Recommendations

This section includes recommendations to improve conditions for both traveling along and crossing roadways. These recommendations include facilities such as sidewalks, curb ramps, pedestrian countdown signals, and median islands. Recommendations for the City of Greensboro are followed by recommendations for the suburban and rural communities in Guilford County.

Note that there are several different methods used in the City of Greensboro to provide pedestrian improvements. These implementation programs include the Sidewalk Construction Program, the Sidewalk Ordinance, the Land Development Ordinance and Street Design Standards, and other efforts. These programs are described in detail in Sections 5.3.2, 5.3.3, and 5.3.4.

4.4.1 Methodology

Recommendations for new sidewalks and pedestrian crossing improvements were developed from existing data, public input, and field work. Sidewalk needs were identified by creating a GIS layer of existing sidewalk locations. This GIS layer is updated on a regular basis to keep track of newly constructed sidewalk sections. By overlaying this sidewalk layer on the roadway network, sidewalk gaps were easy to identify. Roadway classifications, transit service, pedestrian trip attractors, and public input were used to prioritize the recommendations for new sidewalks (see description in the following section).

The pedestrian crossing recommendations were based on pedestrian safety, public input, and field observations. A sample of 47 pedestrian crossing improvement locations was selected within the City of Greensboro. Many of these locations had a high concentration of pedestrian crashes between 2000 and 2004. Field visits were made to each of the locations in order to develop specific recommendations for pedestrian improvements. Outside of the City of Greensboro, pedestrian recommendations were focused in the communities of Oak Ridge, Pleasant Garden, Sedalia, Stokesdale, and Summerfield. In addition to a list of recommended improvements in each community, conceptual design drawings were generated for one intersection in each community to illustrate potential pedestrian improvements. These recommendations were generated through field work and discussed with community representatives at meetings in early 2006.

4.4.2 Sidewalk Recommendations

This section describes sidewalk facility recommendations in the City of Greensboro. The locations of recommended new sidewalks are shown on a sidewalk plan map (see Maps 4.6 and 4.7, Sidewalk Recommendations). The sidewalk recommendations reflect a range of factors, including:

- Safety (roadway type, traffic volumes and speeds)
- Demand (presence of a worn path in the roadway shoulder or other observation of significant pedestrian activity; proximity to destinations such as public transportation, shopping, residential and particularly higher density residential uses, schools, parks and etc.)
- Connectivity (filling key gaps in the sidewalk system by filling in short gaps between existing sidewalk sections and extending sidewalk to important destinations)

Constraints that would render sidewalk either impossible or cost-ineffective have also been considered, to the extent that this information is known.

The sidewalk plan map is intended to provide a flexible guide for the community that can be responsive to changing conditions and community priorities. It is



important to note that these recommendations are based on current knowledge, conditions, and projects, and are intended to be updated on an ongoing future basis. Public sidewalk projects not shown on the map can be expected in the future. For example, sidewalk petition projects will continue to arise on an ongoing basis. Also, as area conditions change due to land use development, modification or expansion of public roadway corridors, or modification or expansion of public transportation routes, new priorities can be expected to arise. Additional information about the City's sidewalk program is provided in Chapter 5.

This plan recommends 362 miles of new sidewalks. These recommended sidewalks are organized into a series of tiers. The tiers have been assigned using an qualitative assessment of need and constraints along with several general guidelines, as described below.

Tier 1

Tier 1 sidewalks are recommended in locations that will complete the sidewalk network on both sides of thoroughfare roadways. Thoroughfares typically have higher traffic volumes, higher speed limits, and are often wider than other streets. These roadways provide a high degree of connectivity across the community. They are also often lined with commercial, residential, or other land use attractors for pedestrian travel. The Tier 1 recommendations also include sidewalks on primary transit routes (that use thoroughfares as well as collector and local roadways). Generally, projects that address a range or priorities (for example, thoroughfares that serve as transit routes and connect commercial services with higher density residential development) will have the highest priority for implementation.

Tier 1 mileage: 88

Tier 2

Tier 2 sidewalk recommendations are intended to complete the sidewalk network on both sides of the higher-level collector roadways (e.g., collector roadways with the greatest amounts of existing or potential pedestrian, bicycle, and automobile activity). These streets often have relatively high speeds and provide connectivity between the local street network and the thoroughfares. The Tier 2 recommendations include sidewalks on both sides of the remaining transit routes on local and collector streets. Some of the thoroughfare roadways on the urban fringe of the City may also have sidewalks recommended as Tier 2.

Tier 2 mileage: 47

Tier 3

Tier 3 sidewalks are recommended to complete the network of sidewalks on both sides of the rest of the collector street system, specifically the mid- to lower-level collector streets. Tier 3 also includes recommendations for sidewalks on selected local streets that provide significant connections in the pedestrian network or are otherwise known to experience a relatively high level of pedestrian demand.

Tier 3 mileage: 118

Tier 4

Tier 4 sidewalks are recommended on similar types of roadways as Tier 3. However, they will generally be implemented after the Tier 3 projects.

Tier 4 mileage: 23

Roadway Projects

The roadway projects category includes a range of locations where sidewalk construction is expected to be tied to more extensive roadway projects. These include planned future roadway projects (such as the Franklin Blvd and Friendly Ave roadway improvement projects) and important future roadway projects where corridor sidewalk installation needs to be coordinated



with future roadway improvements (such as Horse Pen Creek Road and Alamance Church Road). The roadway projects category can also include lower-level streets without curb and gutter and bad topographic or other corridor conditions for back-of-ditch sidewalks but have a high level of pedestrian demand (such as Lindley Road and parts of Sykes Avenue).
Roadway (Incidental) Projects mileage: 87

Safe Routes to School
Local street school area sidewalk connection needs are currently under evaluation and are expected to appear on future updates of the Future Sidewalk Plan Map.

4.4.3 Urban Roadway Pedestrian Crossing Improvements

Background
Improving the safety and convenience of roadway crossings is essential for making the Greensboro Urban Area more walkable. Pedestrians have a much greater risk of being struck by a vehicle when crossing a roadway than walking on the shoulder or sidewalk beside it. Over 70% of the pedestrian crashes reported to police in the City of Greensboro between 2000 and 2004 involved pedestrians crossing roadway travel lanes (the other crashes were on shoulders, sidewalks, parking lots, and off-road locations)[1]. Nationally, nearly 75% of all police-reported pedestrian crashes involve pedestrians crossing roadway travel lanes[2]. Many of the pedestrian crashes in Greensboro were in roadway corridors with multiple travel lanes in each direction, high speeds (35 m.p.h. or higher) and high traffic volumes (10,000 ADT or higher) (e.g., High Point Road, Randleman Road, Summit Avenue, etc.).

This report recommends a number of engineering solutions to improve difficult pedestrian crossing locations, including constructing median islands, reducing turning radii, and adding pedestrian countdown signals. These treatments, when combined with education and enforcement programs, can make crossings more convenient and help reduce pedestrian crashes. Please note that this is a planning level analysis. Each of these locations will include a more detailed project-level review. The conclusions reached through more detailed review may vary from those presented herein.

Key Corridors for Pedestrian Crossing Improvements
- Battleground Avenue
- High Point Road
- Lee Street
- Summit Avenue
- Aycock Street
- Bessemer Avenue
- Wendover Avenue
- West Friendly Avenue
- West Market Street
- Randleman Road
- North Elm Street
- Eugene Street

Some of the recommended roadway treatments may also help decrease motor vehicle speeds. Lower vehicle speeds will reduce the severity of injuries when crashes occur. When hit by a vehicle traveling at 40 miles per hour, a pedestrian has an 85% chance of being killed; at 30 miles per hour, the likelihood decreases to 45%; and at 20 miles per hour the pedestrian fatality rate is only 5%[3].

Locations of Improvements
This plan recommends 45 specific locations for pedestrian crossing improvements within the City of Greensboro (see Map 4.6, Recommended Pedestrian Facilities). These locations are some of the most critical locations in terms of pedestrian safety, as determined by police crash reports, field evaluation, and public



input. The majority of locations recommended for improvements are on multi-lane roadways with high-volume, high-speed traffic (see list above). In the future, the MPO should do a systematic evaluation of pedestrian crossings throughout the Urban Area and surrounding communities to identify specific safety needs and prioritize additional safety improvements.

Using a Combination of Treatments to Make Crossings Safer

The goal of the recommended improvements is to help pedestrians cross roadways safely. This often requires using a combination of safety treatments, particularly on multi-lane roads with high speeds and traffic volumes. Marked crosswalks are one tool that is commonly used to improve pedestrian crossings. However, in many cases, marked crosswalks alone are not sufficient to increase pedestrian safety. Additional treatments should be used to supplement marked crosswalks. FHWA guidelines state, "In most cases, marked crosswalks are best used in combination with other treatments (e.g., curb extensions, raised crossing islands, traffic signals, roadway narrowing, enhanced overhead lighting, traffic calming measures etc.)."[4] Therefore, combinations of several types of safety treatments are recommended to improve crossings in Greensboro.

Types of Improvements

Improving pedestrian safety at the 47 crossing locations will require a combination of treatments. The matrix on the following page (Table 4(f)) lists the specific treatments that should be applied at each crossing to improve pedestrian safety (see Maps 4.6 and 4.7, Recommended Pedestrian Facilities). Note that the matrix shows conceptual-level recommendations for each intersection. Each intersection will require detailed engineering analysis to determine the feasibility and design of each treatment before the improvements are made.

Some of the improvements are listed as short-term recommendations, indicating that this is the first set of changes that should be made at each intersection. Other improvements are listed as long-term recommendations. While these recommended solutions focus on physical changes, they should be complemented by education and enforcement programs that target pedestrian, bicyclist, and driver behavior.

An appropriate combination of physical improvements is recommended for each crossing location. The types of physical improvements that are recommended are described below. There are four general categories of improvements:

- Roadway modifications
- Traffic signals
- Signs
- Visibility

The types of improvements listed below are appropriate for controlled (traffic signals, stop signs, etc.) or uncontrolled locations unless otherwise indicated.

Roadway Modifications

Marked Crosswalks

Legally, crosswalks exist where two streets intersect whether or not they are denoted with markings[5]. High-visibility crosswalks are recommended at many of the 45 pedestrian crossing improvement locations in Greensboro to alert motorists to locations where they should expect

Figure 4(ddd). The high-visibility crosswalks across Randleman Road at Tyrrell Street give a clear indication that drivers should yield to pedestrians as they cross the roadway.

Note: The crossing improvements listed in the table below are conceptual-level recommendations for each intersection. Each intersection will require detailed engineering analysis to determine the feasibility and design of each treatment before the improvements are made.

The numbers in this table correspond to locations shown on the recommendations map within Greensboro City Limits. Recommended pedestrian crossing improvements in the surrounding communities are described in the section on current implementation efforts and recommendations in Unincorporated Guilford County and area towns.

Recommended Pedestrian Crossing Improvements*

#	Location	Traffic Control on Main Road	Stripe New Crosswalk Markings	Restripe Existing Crosswalk Markings	Reconstruct Existing Curb Ramps	Construct New Curb Ramps	Median Islands	Curb Extensions	Reduce Turning Radius	Remove Travel Lanes	Provide Overpass or Underpass	Pedestrian Countdown Signal Heads	Leading Pedestrian Interval at Signal	Restrict Right-Turn On Red	Pedestrian-Activated Traffic Signal (Midblock)	High-Visibility Pedestrian Warning Signs	In-Roadway Pedestrian Crossing Signs	Improve Pedestrian Lighting	Remove Sight-Distance Obstruction	Notes
1	Lake Brandt Road & Lawndale Drive	Traffic Signal					L		S			S				S		S		Install pedestrian countdown signals on east and west legs of the intersection
2	Old Battleground Road & Lake Brandt Road	Traffic Signal	S			S			S			S				S		S		Stripe new crosswalks on N, W, and S legs of intersection; CHANGE this location to one block south in GIS
3	Bridford Parkway & W Wendover Avenue	Traffic Signal	S			S	L			L		S	L			L		S		
4	Stanely Road & W Wendover Avenue	Traffic Signal	S				L		S			S		L				S	S	
5	Greensboro Auto Auction Area	Uncontrolled					L			L						S		S		Very difficult to cross roadway during rush-hour
6	Spring Garden Street & Howard Street	Uncontrolled	S		S			S								S	S	S	S	Curb extensions should also be constructed at other intersections along Spring Garden Street when this crossing is improved
7	College Road & Hunt Club Road	Traffic Signal			S							S	L	S		S		S	S	
8	W Friendly Avenue & Dolley Madison Road	Traffic Signal			S							S				S		S		
9	Tower Road & Montrose Drive	Stop Signs			S		L									S		S		
10	Market Street & US 29 On/Off Ramp	Traffic Signal	L			L	L		L							S		S		Add sidewalk through splitter island on N side of intersection
11	E Market Street & N English Street	Traffic Signal	S			S	L		L			S	L	S		L		S		Fix sidewalk across railroad tracks southwest of the intersection to provide uninterupted access-way
12	Sands Drive & US 29 Access Roads	Uncontrolled																S		Pedestrian bridge has been constructed at this location. In addition, add sidewalks to access roads on both sides of US L9; improve access to pedestrian bridge from neighborhoods by providing additional steps where informal paths have developed; improve lighting on and near the pedestrian bridge
13	Phillips Avenue between Bywood Road and Lombardy Street	Uncontrolled	S				S									S		S		Stripe crosswalk and provide median island and curb ramps at location with greatest pedestrian desire lines between Blywood Road and Lombardy Street (further up the hill from the existing crossing location--many people do not use the existing marked crosswalk because it is too far out of the way)
14	High Point Road & Paschal Street	Uncontrolled	L			S	S			L		L			L	S		S		
15	Meadowview Road & High Point Road	Traffic Signal		S	S		S		L	L		S		L		S		S		Install "Turning Vehicles Yield to Pedestrians" sign at intersection
16	Randleman Road & Terrell Street	Traffic Signal	S		S		S					S				S		S		Stripe new crosswalks on N, W, and E legs of intersection
17	Meadowview Road & Randleman Road	Traffic Signal		S	L		S			L		S						S	S	Remove bushes at SOLO Gas Station corner
18	Randleman Road & Farragut Street	Uncontrolled	L				L		L	L		L			L	S		S		
19	Creek Ridge Road & Randleman Road	Traffic Signal	S			S	L			L		S				S		S		
20	Holden Road & Phoenix Drive	Traffic Signal	S			S	S		L			S				S		S		
21	Church Street & State Street	Uncontrolled	S			S	S									S		S		Improvements can be made as part of Church Street Reconstruction Project
22	Church Street & Northwood Street	Traffic Signal	S		S							S	L			S		S		Stripe new crosswalk on N leg of intersection; reconst curb ramps so that there are two per corner; add pedestrian push-buttons to north leg of intersection. Improvements can be made as part of Church Street Reconstruction Project.
23	Church Street & Bessemer Avenue	Traffic Signal		S					L			S	L	S		S		S	L	Replace bridge railings to the east of the intersection; Existing bridge railing obstructs view of drivers turning right from westbound Bessemer to northbound Church
24	Bessemer Avenue & Summit Avenue	Traffic Signal		S	S		S		S	L		S				S		S		
25	Summit Avenue & 3rd Street	Uncontrolled	S		S	S	S		S	L		S						S	S	Re-design intersection; Evaluate signal warrants and consider installing traffic signal
26	Eugene Street & Lindsay Street	Traffic Signal					S						L	L		S		L		
27	Eugene Street & Friendly Avenue	Traffic Signal			S		L			L		S	L	L		S		L		
28	Eugene Street & Market Street	Traffic Signal			S		L			L			S	L				L		Install "Turning Vehicles Yield to Pedestrians" sign at intersection
29	Eugene Street & Washington Street	Traffic Signal			S		L			L			L	L				L		Install "Turning Vehicles Yield to Pedestrians" sign at intersection
30	Eugene Street & Lee Street	Traffic Signal					S					S	L	S				S		
31	Eugene Street & Bragg Street	Uncontrolled	L			S	S			L		L			L			S		Provide median islands at midblock locations on Eugene Street to the north and south of Bragg Street
32	Eugene Street & Whittington Street	Traffic Signal			S		S			L		S				S		S		Provide median islands at midblock locations on Eugene Street to the north and south of Whittington Street
33	Walker Avenue & Aycock Street	Traffic Signal		S	S		L						S	S				S		New pedestrian countdown signals should be added for the east and west legs of the intersection; Improving lighting is very important at this location
34	High Point Road & Husbands Street	Uncontrolled	L			S	L			L		L			L	S		S		Evaluate signal warrants and consider providing a traffic signal at this location
35	High Point Road & Maywood Street	Uncontrolled	L			S	L			L		L			L	S		S		
36	High Point Road & Florida Street	Traffic Signal		S	S		S			L		S		L		S		S		
37	High Point Road & Hilltop Road	Traffic Signal			S		L			L		S		L		S		S	L	
38	Battleground Avenue & Pisgah Church Road	Traffic Signal	S				L		S		L	S		L				S	S	Remove bushes that obstruct sight-distance; add pedestrian push-buttons to E, S, and W crosswalks
39	W Friendly Avenue & College Road	Traffic Signal			S		L		L	L		S		L		S		S		Key location near Guilford College; push-buttons are needed at all corners
40	Cornwallis Road & Dellwood Drive	Traffic Signal														S		S		Increase driver awareness of frequent bicycle crossings at intersection
41	Cornwallis Road & Lafayette Avenue	Uncontrolled	L													S	L	S		Increase driver awareness of frequent bicycle crossings at intersection; study potential uncontrolled crosswalk; consider traffic signals in the future

Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Table 4-f

Pedestrian Crossing Improvements

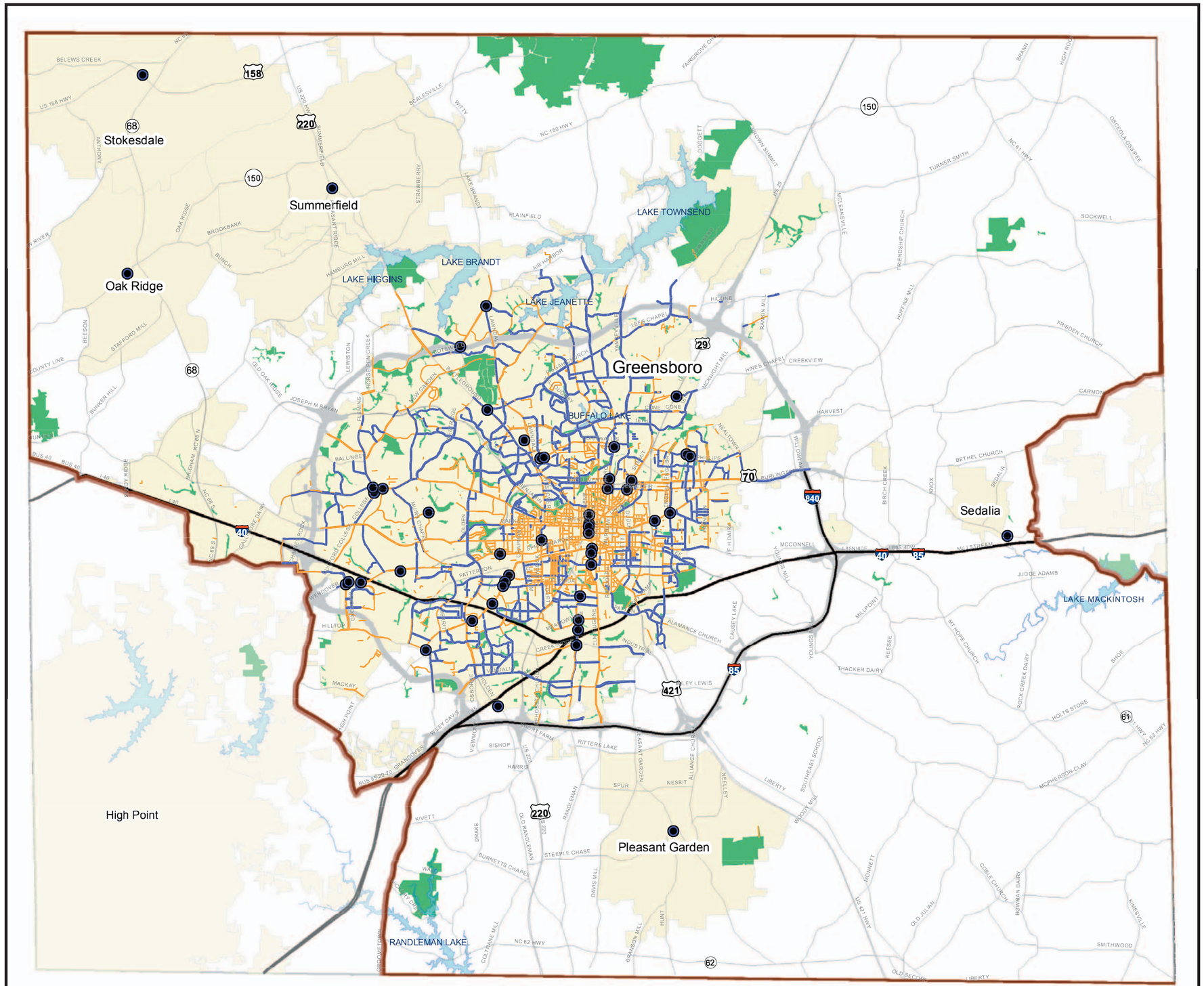
Legend

S= Short-Term Recommendations

L= Long-Term Recommendations

Top Priority Improvements

*Note that recommended facilities at intersections apply to at least one corner or leg of the intersection;they may not be necessary or appropriate for all parts of the intersection.



Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Map 4.6

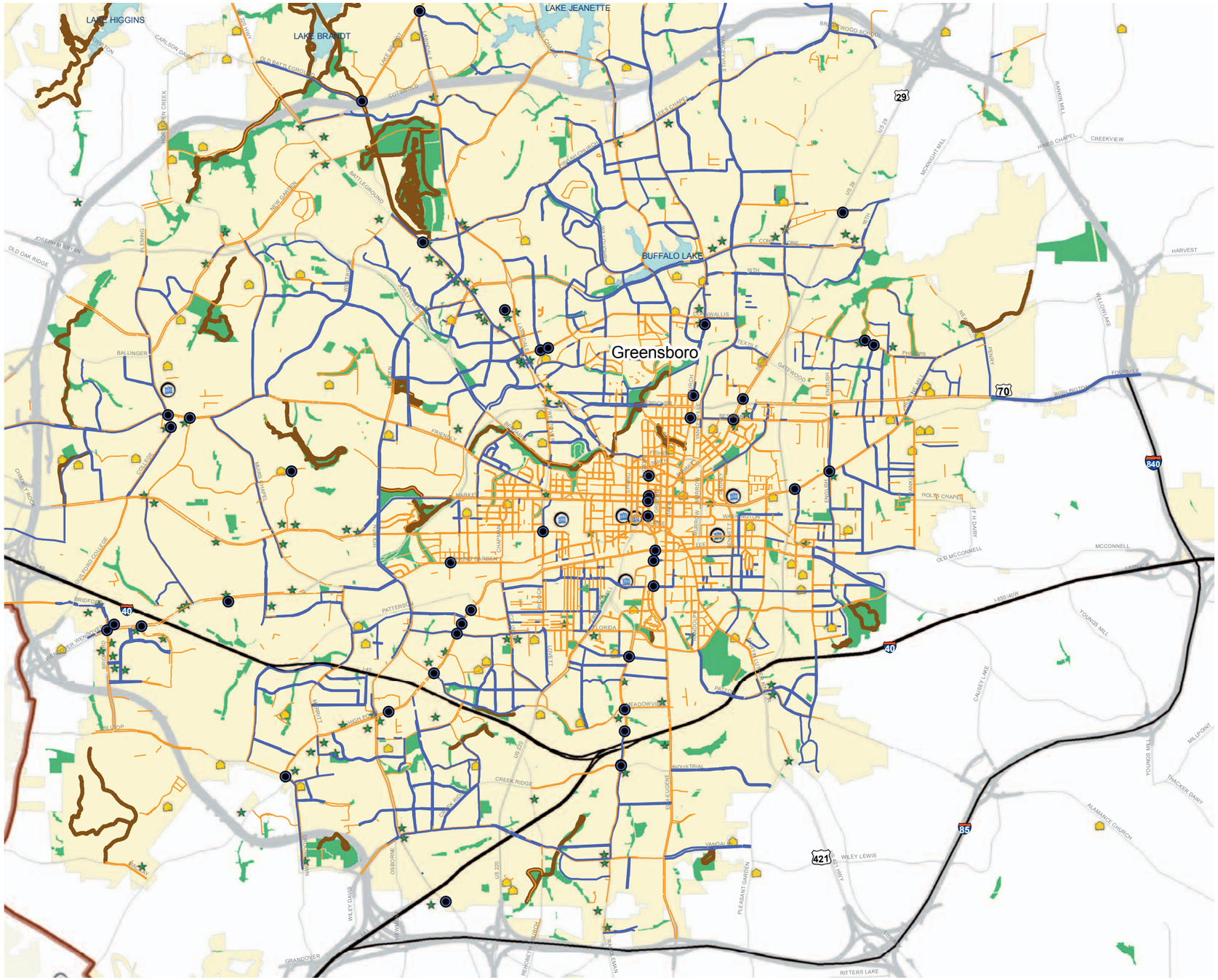
Recommended Pedestrian Facilities

Legend

- Pedestrian Crossing Improvements
- Proposed Sidewalk
- Existing Sidewalk
- Urban Loop
- Interstate
- Parks
- Incorporated
- Greensboro MAB
- Lakes

1 Miles

Data Source: City of Greensboro



Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Map 4.7

Recommended Pedestrian Facilities (Inside Urban Loop)

Legend

- Ped Xing Improvements
- Proposed Sidewalk
- Existing Sidewalk
- Existing Trails
- Colleges
- Schools
- Shopping
- Interstate
- Urban Loop
- Major Roads
- Greensboro MAB
- Lakes
- Parks
- Incorporated
- County Boundary

1 Miles

Data Source: City of Greensboro



pedestrians and to show pedestrians preferred crossing locations. This may involve striping new crosswalks where they do not currently exist, restriping crosswalks that have worn away, or restriping crosswalks that need to be moved to a more appropriate location.

While the City of Greensboro has used a variety of crosswalk types, including standard parallel line markings and colored crosswalks (with stamped asphalt or pavers), high-visibility crosswalk markings are recommended for these 45 key crossing locations. The high-visibility crosswalks are similar to standard crosswalks, but they also have thick white bars parallel to the direction of travel. This may help make drivers more aware of pedestrians crossing in these critical locations.

A majority of the key locations for pedestrian crossing improvements in Greensboro are controlled intersections (intersections with stop signs or traffic signals). Crosswalks should be marked across all street approaches at these intersections.

Several of the locations recommended for crossing improvements in Greensboro are uncontrolled crossings. These locations include:

- Spring Garden Street & Howard Street
- Phillips Avenue between Bywood Road and Lombardy Street
- High Point Road & Paschal Street
- Randleman Road & Farragut Street
- Church Street & State Street
- Summit Avenue & Third Street
- Eugene Street & Bragg Street
- High Point Road & Husbands Street
- High Point Road & Maywood Street

Pedestrian crossings should be designed to maximize pedestrian safety. The MUTCD states that: "Crosswalk lines should not be used indiscriminately. An engineering study should be performed before they are installed at locations away from traffic signals or STOP signs." A recent national research project completed by the Federal Highway Administration provides specific guidance on the installation of crosswalks and other safety measures at uncontrolled locations[6]. The results of this study clearly indicate the safety value of enhanced pedestrian crossing measures at midblock crossings and other uncontrolled locations (such as T-intersections). Safety measures that are recommended include crossing islands, raised crossings, and other traffic calming techniques, as well as additional warning signs and signal treatments in some locations.

Crosswalks are recommended at each of these locations, and it is critical to supplement these crosswalks with the additional treatments listed above. Marked crosswalks alone (i.e., without traffic-calming treatments, traffic signals and pedestrian signals when warranted, or other substantial crossing improvement) are insufficient and should not be used under the following conditions:

- Where the speed limit exceeds 40 mph.
- On a roadway with four or more lanes without a raised median or crossing island that has (or will soon have) an ADT of 12,000 or greater.
- On a roadway with four or more lanes with a raised median or crossing island that has (or soon will have) an ADT of 15,000 or greater[6].

As the City of Greensboro and surrounding communities evaluate uncontrolled crossings in the future, they should use the decision tree shown in Figure 4(eee) and Figure 4(fff) to determine appropriate safety treatments based on vehicular speeds, volumes, and number of travel lanes.

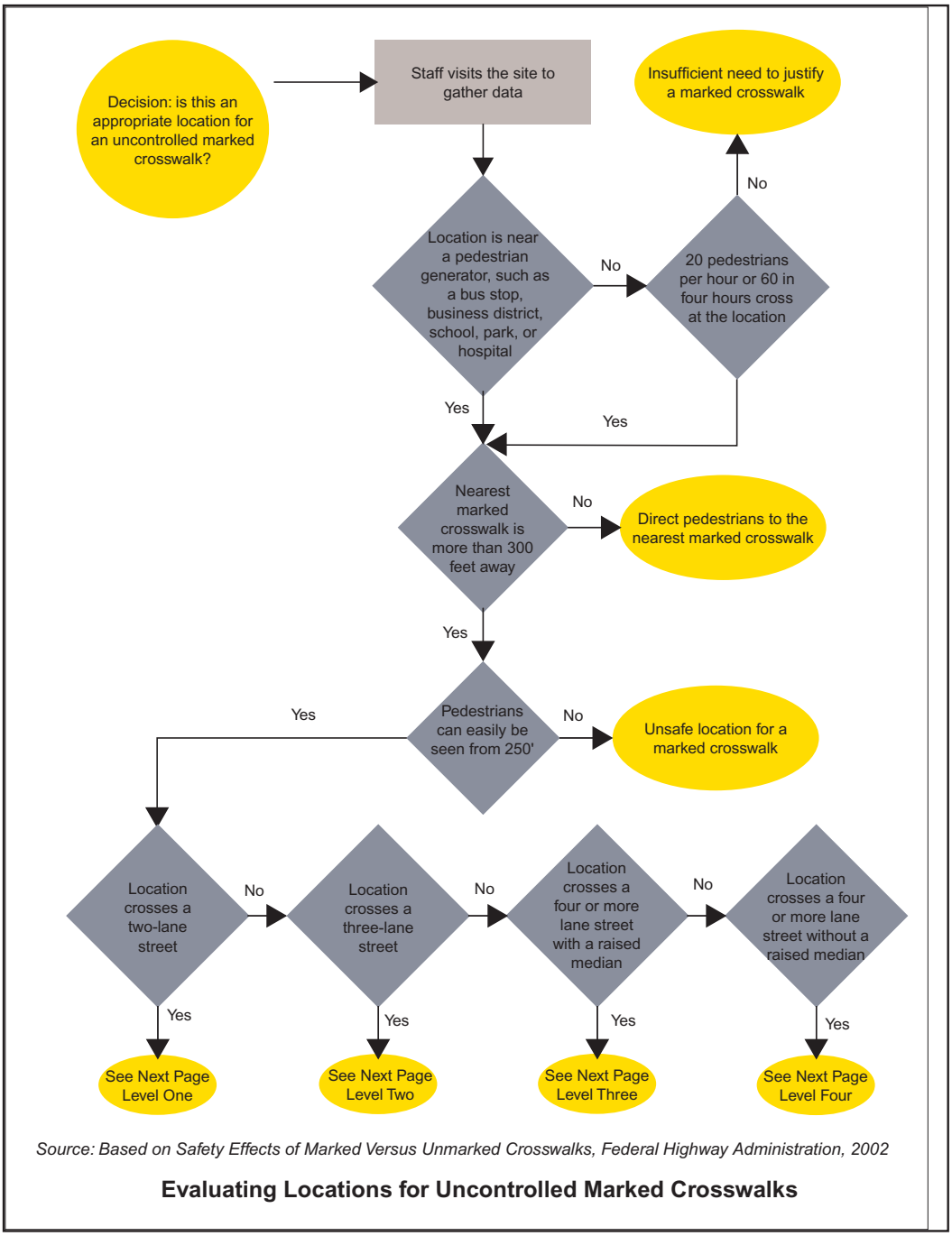


Figure 4(eee). Uncontrolled Marked Crosswalk Decision Tree, page 1.



Level 1: 2 Lane Street					Level 3: 4 or more Lanes with a Raised Median			
NUMBER OF CARS (ADT)	POSTED SPEED 30 mph or less	35 mph	40 mph or more		NUMBER OF CARS (ADT)	POSTED SPEED 30 mph or less	35 mph	40 mph or more
Up to 12,000 cars per day	High visibility cross-walk markings	High visibility cross-walk markings	High visibility cross-walk markings plus an engineering treatment (see below)		9,000 cars or fewer per day	High visibility cross-walk markings	High visibility cross-walk markings	High visibility cross-walk markings plus an engineering treatment (see below)
12,000-15000	High visibility cross-walk markings	High visibility cross-walk markings	Pedestrian signal or grade separated crossing		9,000-12,000	High visibility cross-walk markings	High visibility cross-walk markings plus an engineering treatment (see below)	Pedestrian signal or grade separated crossing
15,000 cars or more per day	High visibility cross-walk markings	High visibility cross-walk markings plus an engineering treatment (see below)	Pedestrian signal or grade separated crossing		12,000-15,000	High visibility cross-walk markings plus an engineering treatment (see below)	High visibility cross-walk markings plus an engineering treatment (see below)	Pedestrian signal or grade separated crossing
					15,000 or more	Pedestrian signal or grade separated crossing	Pedestrian signal or grade separated crossing	Pedestrian signal or grade separated crossing

Level 2: 3 Lane Street					Level 4: 4 or more Lanes without a Raised Median			
NUMBER OF CARS (ADT)	POSTED SPEED 30 mph or less	35 mph	40 mph or more		NUMBER OF CARS (ADT)	POSTED SPEED 30 mph or less	35 mph	40 mph or more
9,000 cars or fewer per day	High visibility cross-walk markings	High visibility cross-walk markings	High visibility cross-walk markings plus an engineering treatment (see below)		9,000 cars or fewer per day	High visibility cross-walk markings	High visibility cross-walk markings plus an engineering treatment (see below)	Pedestrian signal or grade separated crossing
9,000-12,000	High visibility cross-walk markings	High visibility cross-walk markings plus an engineering treatment (see below)	High visibility cross-walk markings plus an engineering treatment (see below)		9,000-12,000	High visibility cross-walk markings plus an engineering treatment (see below)	High visibility cross-walk markings plus an engineering treatment (see below)	Pedestrian signal or grade separated crossing
12,000-15,000	High visibility cross-walk markings plus an engineering treatment (see below)	High visibility cross-walk markings plus an engineering treatment (see below)	Pedestrian signal or grade separated crossing		12,000-15,000	Pedestrian signal or grade separated crossing	Pedestrian signal or grade separated crossing	Pedestrian signal or grade separated crossing
15,000 or more	High visibility cross-walk markings plus an engineering treatment (see below)	Pedestrian signal or grade separated crossing	Pedestrian signal or grade separated crossing		15,000 or more	Pedestrian signal or grade separated crossing	Pedestrian signal or grade separated crossing	Pedestrian signal or grade separated crossing

Engineering Treatments
Road Diet
Crossing Islands
Curb Extensions
Advance Stop Lines
In-Roadway Warning Lights
Pedestrian Signals
Grade Separated Crossing (should not be used in conjunction with High visibility crosswalk markings)

Engineering Treatments for Uncontrolled Marked Crosswalks

Figure 4(fff). Uncontrolled Marked Crosswalk Decision Tree, page 2.



Curb ramps

Accessible curb ramps should be provided at every crosswalk in Greensboro. Two types of curb ramp improvements are shown in the recommendations matrix: 1) constructing new curb ramps at crosswalks where they do not exist and 2) retrofitting existing curb ramps to make them comply with Americans with Disabilities Act (ADA). A number of the crossings identified as key locations for pedestrian improvements in Greensboro are missing one or more curb ramps.

All curb ramps in Greensboro are to meet the requirements of the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG). Accessible curb ramps will be provided when roads are resurfaced or reconstructed. These rules specify appropriate cross-slopes, tactile warning devices, contrasting colors, and other features for curb ramps (the ADAAG rules are available at http://www.access-board.gov/prowac/draft.htm). Though it is not requirement, it is recommended that the City provide a curb ramp for each crosswalk extending from a corner rather than a single curb ramp pointing into the center of the intersection.

Figure 4(ggg). Median islands have been installed on Eugene Street south of Market Street (left) and on North Church Street near Moses Cone Memorial Hospital (right).

Median islands

Median islands (or pedestrian crossing islands) allow pedestrians to cross one direction of motor vehicle traffic at a time. Studies show that they reduce pedestrian crashes[1]. Median islands (or raised median strips) should be installed to help improve pedestrian safety and comfort at a majority of the locations recommended for crossing improvements. They are likely to be a long-term improvement on roadways where significant geometric changes are needed to provide enough space for the median island.

Curb extensions

Curb extensions shorten pedestrian crossing distance and increase the visibility of pedestrians at roadway crossings. By narrowing the curb-to-curb width of a roadway, curb extensions may also help reduce motor vehicle speeds and improve pedestrian safety. Curb extensions are appropriate for locations that have on-street parking. This treatment has been used effectively in Greensboro on Elm Street, and new curb extensions are recommended on Spring Garden Street between Aycock Street and Lindell Road, including at the intersection of Spring Garden Street and Howard Street. The recommended curb extensions at the Howard Street intersection should also be complemented by in-roadway pedestrian crossing signs, high-visibility pedestrian warning signs, and improved lighting.

Figure 4(hhh). The curb extensions on Elm Street shorten pedestrian crossing distance and increase the visibility of pedestrians crossing the street.



Curb radius reduction

Wide curb radii allow motorists to make high-speed turning movements. Reducing the curb radii at the corners of an intersection helps slow turning vehicles, improves sight distance between pedestrians and motorists, and shortens the crossing distance for pedestrians. Surrounding land uses and the traffic composition on the roadway are important to evaluate when considering this treatment. If a curb radius is too small, trucks and buses may drive over the curb and endanger pedestrians. In Greensboro, curb radii should be evaluated at the same time as other geometric improvements at an intersection.


Figure 4(iii). The intersection of High Point Road and Meadowview Road has very large turning radii, allowing vehicles to make high-speed turns and creating a longer pedestrian crosswalk (left). This design is also bad for pedestrians with visual disabilities. The intersection of Aycock Street and Walker Avenue has shorter turning radii, which slow vehicle turning movements and shorten the total pedestrian crossing distance.

Travel lane removal

Several of the critical pedestrian crossing locations in Greensboro could be improved by removing existing travel lanes on roadways that appear to have excess vehicle capacity. Removing travel lanes may involve removing through-travel lanes or replacing a center-turn lane with raised median islands or a median strip. This treatment reduces pedestrian crossing distance and exposure to vehicular traffic. There are several roadways in Greensboro where lanes could be removed in the long-term as a part of corridor reconstruction projects. Each of these streets has multiple pedestrian crossing locations that could benefit from this change:

- South Eugene Street
- High Point Road
- Randleman Road

Removing travel lanes often requires tradeoffs between travel modes within a roadway corridor. Engineering analysis should be conducted to evaluate the impact of removing travel lanes on all modes, including transit, motor vehicle, bicycle, and pedestrian transportation before lanes are removed.

Overpasses and Underpasses

Overpasses and underpasses separate pedestrian traffic from vehicular traffic, allowing pedestrians and bicyclists to cross busy streets without potential conflicts. Because they are expensive to construct, they should be reserved for locations where there is a high demand for pedestrian and bicycle crossings and the danger of crossing the roadway is high (the bridge over US 29 at McKnight Mill Road is a good example). Ideally, overpasses and underpasses should take advantage of the topography at a site—grade separations are less expensive to construct and more likely to be used if they can help pedestrians avoid going up and

Figure 4(jjj). An overpass has been provided across US 29 at McNight Mill Road (above). Overpasses and underpasses should have adequate width and lighting, and be simple to patrol to provide personal security for users (below).



down slopes, ramps, and steps. Adequate width (for users to pass each other comfortably), lighting, and surveillance should also be provided to increase security of these crossings.

An underpass is recommended at or near the intersection of Battleground Avenue and Pisgah Church Road to create a safe connection across Pisgah Church Road for the new Battleground Rail Trail on the east side of Battleground Avenue. This underpass will also allow trail users to cross Pisgah Church Road without delays at the traffic signal.

Figure 4(kkk). Raised crosswalks slow motor vehicles and make pedestrians more visible to approaching motorists.

Raised pedestrian crossings

Raised pedestrian crossings (raised crosswalks) provide a continuous route for pedestrians at the same level as the sidewalk. Approaching vehicles must slow down to go over raised crosswalks comfortably. This encourages motorists to yield and makes crossing the street safer for pedestrians. Pedestrians are also positioned slightly higher than the road surface, which makes them more visible to approaching motorists. Pavement markings on the slope of the raised crosswalk can improve the visibility of the raised crosswalk to motorists. Raised crossings eliminate the grade separation between the sidewalk and road surface, making the crossing more comfortable. However, pedestrians should continue to cross with caution at these locations. This treatment is appropriate for low-speed locations, such as low-volume neighborhood residential streets and shopping center parking lots.

Traffic Signals

Pedestrian countdown signal heads

Pedestrian countdown signals heads are beneficial at intersections with high pedestrian crossing volumes and/or long crossing distances because they indicate the number of seconds remaining for pedestrians to complete crossing the street. It is the policy of the City of Greensboro and NCDOT to install pedestrian countdown signals at all signalized intersections and whenever an existing signal is modified. The City has already installed countdown signals at several intersections in Downtown Greensboro and at other key crossings in the City. Countdown signals should be installed in place of traditional pedestrian signals at the most important signalized pedestrian crossings in Greensboro (e.g., near schools, senior centers, hospitals, parks, etc.). Countdown signals should be provided at all other intersections in Greensboro that have traffic signals.

Many traffic signals in Greensboro rely upon pedestrians to push a button (pedestrian actuation) in order for pedestrians to receive the “walk” signal and adequate crossing time. When actuation is required, the City should use Accessible Pedestrian Signals. These signals provide audible and/or vibrotactile information to help pedestrians with visual disabilities identify when the “WALK” phase occurs. In addition, the push buttons should be placed in convenient locations.



Pedestrian actuation should be avoided when pedestrian crossings are frequent. Instead, locations with frequent pedestrian crossings should have an automatic walk cycle in order to reduce pedestrian delay.

Figure 4(III). Pedestrian countdown signals are used at the intersection of Eugene Street and Washington Street.

Leading pedestrian interval

At signalized intersections with high pedestrian crossing volumes, the signals can be programmed to allow pedestrians to begin crossing 2 to 4 seconds before the vehicle traffic on the parallel street is given a green light. This low-cost treatment gives pedestrians enough time to cross to the middle of the street so that turning vehicles can see them, be aware of them, and yield to them before they receive a green light. It is also possible to use the LPI only during certain times of the day, such as between 7 a.m. and 7 p.m., whenever the highest numbers of pedestrians are typically present. A study of a three-second leading pedestrian interval (LPI) found that the LPI decreased conflicts between turning motor vehicles and increased the percentage of motorists that yielded to pedestrians in the crosswalk[1].

Traffic signals with LPI have a longer all red phase, which may tempt drivers to take advantage of the extra time and run red lights. This type of behavior should be prevented through education and strict enforcement. Because the LPI has not been used in the City before, this treatment could be tested as a temporary treatment at two intersections, such as Walker Avenue & Aycock Street and Eugene Street & Market Street, for 3 to 6 months to see how well it works for all modes.

LED signs should also be tested for effectiveness at reducing conflicts between pedestrians and turning vehicles. The high-visibility LED signs could display the words, “TURNING VEHICLES MUST YIELD TO PEDESTRIANS”, or a similar message. These signs could be used as an alternative or a complement to the LPI.

Right-Turn On Red restriction

Motorists are required by law to stop at red lights before making a permissive right-turn-on-red. Though the City of Greensboro currently uses a sign that states, “TURNING TRAFFIC MUST YIELD TO PEDESTRIANS”, motorists often roll through the stop (especially at intersections with wide turning radii) and focus only on the traffic approaching from their left. This may prevent them from seeing pedestrians crossing from their right. In addition, drivers often pull into the crosswalk to wait for a gap in traffic, blocking the path of pedestrians and putting them at risk of being struck by the vehicle[1].

To address this problem, the City should require drivers to wait for the green light to turn right at intersections with high pedestrian volumes. “NO RIGHT TURN ON RED” signs should be used to provide a clearer message to drivers in locations with high pedestrian volumes. The existing signs can be kept to continue reminding drivers of their responsibility to yield to pedestrians when turning during a green light phase. It may be desirable



for the City to test the right turn restriction at three to five intersections for 3 to 6 months and evaluate its impacts on all travel modes. The City could also experiment with applying the restriction only during certain times of day with more pedestrian activity, such as 7 a.m. to 7 p.m.

Figure 4(mmm). The City currently uses "TURNING TRAFFIC MUST YIELD TO PEDESTRIANS" signs, but should also add "NO RIGHT TURN ON RED" signs at

Pedestrian-actuated traffic signal (midblock)

At busy mid-block pedestrian crossings, pedestrian-actuated traffic signals should be considered for regulating vehicular traffic. Extensive guidance and standards for pedestrian signal warrants are provided in the MUTCD (Section 4C). Locations where pedestrian-actuated traffic signals are recommended in the long-term include:

- Randleman Road at Farragut Street
- Eugene Street at Bragg Street
- High Point Road at Husbands Street, Ellington Street, Immanuel Street, or Maywood Street
- High Point Road at Paschal Street

Note that pedestrian crossing activity and crash data indicate the need for pedestrian-actuated signals at these locations—the City should conduct more detailed reviews at each intersection.

New High-Intensity Activated Crosswalk (HAWK) Signals should also be considered at midblock locations where pedestrian-activated traffic signals are recommended in Greensboro. These signals allow the traffic light to stay green for roadway traffic until a pedestrian pushes the button. When the button is pushed, the traffic light turns to yellow and red like a typical traffic signal. When traffic receives the red light, the pedestrian signal provides the WALK indication to the pedestrian. After the pedestrian begins to cross and the flashing DON'T WALK indication starts, drivers are given a flashing red signal that allows the drivers to proceed as soon as the pedestrian clears the crosswalk and conditions are safe. The City of Greensboro and surrounding jurisdictions should consult the MUTCD to help determine appropriate locations for this treatment. In addition, the City could do a study of driver expectations and conduct an educational campaign to help motorists and pedestrians understand how they should behave at this type of signal.

Figure 4(nnn). Pedestrian HAWK signals stop traffic when activated by pedestrians. Photo by Richard Nassi, City of Tucson, AZ.



Signs

High-visibility pedestrian warning signs

High-visibility pedestrian warning signs are recommended at most of the locations identified for pedestrian crossing improvements in Greensboro. These signs can increase driver awareness of pedestrians, especially in areas where pedestrians may not be expected. A fluorescent yellow/green color is approved in the national MUTCD and can be used on these signs (the W11-2 Pedestrian Crossing Sign). According to the MUTCD, these signs "should only be used at locations where the crossing activity is unexpected or at locations not readily apparent." These signs will be most effective when combined with other treatments, such as marked crosswalks, curb extensions, median islands, etc. Flashing lights can also be used, in appropriate situations, to grab the attention of drivers. Signs should be used judiciously—too many signs can cause visual clutter and lead to non-compliance.


Figure 4(ooo). Advance warning signs are designed to make drivers more aware of pedestrians as they approach a crosswalk. The City is using these signs on Eugene Street (left) and East Market Street (right).

In-roadway pedestrian crossing warning signs

In-roadway pedestrian crossing signs are bright yellow signs placed in the middle of the road at marked crosswalks. These signs are included in Section 2B.12 of the MUTCD. They remind drivers of their responsibility to yield to pedestrians in the crosswalk by stating, "STATE LAW—YIELD TO PEDESTRIANS IN CROSSWALK." These signs are already being used at pedestrian crossings on North Elm Street, Market Street, Eugene Street and other locations in Greensboro. In-roadway pedestrian crossing signs are recommended to be installed on Spring Garden Street at Howard Street (along with high-visibility crosswalks and curb extensions). The City and surrounding jurisdictions should also consider using these signs at other appropriate locations in the future. They are not for use at signalized intersections (per MUTCD).

Figure 4(ppp). In-roadway pedestrian crossing signs remind drivers to stop or yield to pedestrians in the crosswalk. These signs are typically placed on the roadway centerline.

Visibility

Lighting improvements

Improving roadway lighting, especially at pedestrian crossings, has been shown to reduce nighttime pedestrian crashes. Pedestrians are adversely affected by low-light conditions: two-thirds of pedestrian fatalities occur between dusk and dawn. Roadway lighting should illuminate all pedestrian crosswalks (standard street lamps should be provided at each end of the crosswalk). Street lights placed on high poles that only illuminate part of an intersection are not adequate. Better lighting will also help improve the personal security of pedestrians walking



in Greensboro at night. Pedestrian lighting should be designed in accordance with the City of Greensboro's lighting specifications.

Preferred pedestrian-scale lighting is characterized by shorter light poles (i.e. 16-foot tall posts), lower levels of illumination (except at crossings), shorter spacing between lamp posts, and lamps that produce a better color definition and "white light" to areas with higher pedestrian volumes.

Pedestrian light poles should be spaced to achieve the light level goals shown in Table 4(g). Distinctive pedestrian lamp posts may be used to improve the appearance of the streetscape. Light poles should be placed either in the buffer zone or on the other side of the sidewalk – and not within the pedestrian through zone (maintain the required clear width of three feet, per current accessibility standards).

Pedestrian Walkways	Commercial		Intermediate		Residential	
	Footcandle	Lux	Footcandle	Lux	Footcandle	Lux
-Sidewalks	0.9	10	0.6	6	0.2	2
-Pedestrian Walks*	2.0	22	1.0	11	0.5	5
Building Sites: -Entrances	5.0	55	Values are given in minimum average maintained horizontal footcandles and lux.			
-Grounds	1.0	11				
Parking Areas: -Self Parking	1.0	11				
-Attendant Parking	2.0	22				

Table 4(g). Recommended Pedestrian Illumination Guidelines (Source: Illuminating Engineering Society of North America) *Crosswalks should be provided with additional illumination producing from 1.5 to 2 times the normal roadway lighting level.

Light poles should be constructed of durable, corrosion resistant materials. Attention should be given to placing light fixtures within reach of a maintenance vehicle parked on the adjacent roadway, to avoid damage to the adjacent sidewalk and landscaped areas. Street lampposts, pedestrian lampposts, and landscape plans must be coordinated to assure that the lights are not engulfed in a canopy of trees.

It is important to provide a higher quality of pedestrian lighting, particularly along sidewalks and walkways with higher volumes of night-time pedestrian activity, specifically in commercial pedestrian districts, in high density residential areas, and near colleges and universities. Street illumination levels should be determined by the type and intensity of adjacent development (see Table 4(g) below).

Sight-distance improvements

Sight-distance obstructions can increase the risk of pedestrians being struck by vehicles at roadway crossings. Several of the locations recommended for pedestrian crossing improvements in Greensboro have landscaping, light poles, bus stop shelters, and other features obstructing the line of sight between drivers and pedestrians. While these features can make a street more attractive and serve other valuable functions, they should be placed in locations that do not obscure drivers' views of pedestrians. The City should conduct site visits to these locations and remove sight-distance obstructions through its Sight Obstructions Maintenance Program. [Residents can report sight obstructions by calling the City's Contact Center (373-2489).]



Figure 4(qqq). Drivers approaching this crossing on the exit ramp from Wendover Avenue onto northbound Summit Avenue can not see pedestrians until they are very close to the crossing.

Figure 4(sss). Landscaping, utility poles, and walls obstruct drivers' views of pedestrians near the intersection of Randleman Road and Meadowview Road.

Figure 4(rrr). Pedestrians crossing Veasley Street at High Point Road are not visible to drivers making right turns off of High Point Road because of the wide turning radius and the existing landscaping.

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Figure 4(ttt). It is very difficult for drivers turning right (north) from Bessemer Avenue onto Church Street to see pedestrians because of the bridge railing and the downward slope of the roadway towards the intersection. In addition, there are no pedestrian signals at this intersection to indicate the appropriate time for pedestrians to cross.



4.4.4. Current Pedestrian Implementation Efforts and Recommendations: Unincorporated Guilford County and Area Towns

Until recently, the towns and unincorporated areas of Guilford County have undertaken relatively few efforts to improve conditions for pedestrians. Within the past decade, sidewalks have been provided in some rural developments in Summerfield, Oak Ride and elsewhere. In addition, sidewalks are required by the City of Greensboro in developments within unincorporated areas that seek and receive City water and sewer. However, for the most part, sidewalks have not been incorporated in the development process.

One goal of this plan is to further the discussion of pedestrian facility needs in the towns and unincorporated areas of Guilford County. The section below recommends specific projects that can be done to improve pedestrian conditions in five communities outside of Greensboro. Most of these improvements will require coordination with NCDOT. Therefore, the MPO should work with NCDOT to establish a "Main Street Retrofit" program in Guilford County. This program should focus on improving pedestrian and bicycle safety and mobility as well as the visual appeal of historic community centers in the Urban Area.

The pedestrian recommendations also include a conceptual drawing for pedestrian improvements at one intersection in each of the five suburban/rural communities. These example drawings illustrate the types of treatments that can be used at intersections throughout the Urban Area. Note that these drawings are conceptual, so they do not have precise measurements. Further detailed design will be needed to develop each project.

1. Oak Ridge

- Work with NCDOT to implement a "Main Street Retrofit" project on Oak Ridge Road (NC 150) between Beeson Road and Bunch Road.
  - o Construct sidewalks on both sides of Oak Ridge Road between Oak Ridge Elementary School and Oak Ridge Military Academy.
  - o Construct sidewalks on both sides of Linville Road between Oak Ridge Road and NC 68.
  - o Add pedestrian accommodations at the intersection of NC 68 and NC 150 (stripe crosswalks on all four legs of the intersection, install pedestrian countdown signal heads, provide curb ramps and ADA improvements, improve lighting, and provide sidewalks on both sides of all approaches to this intersection).
  - o Add pedestrian accommodations at the intersection of Linville Road and Oak Ridge Road (stripe crosswalks on all four legs of the intersection, provide curb ramps and ADA improvements, improve lighting, provide pedestrian crossing islands at the crossings of Oak Ridge Road, and add sidewalks on both sides of all approaches to this intersection).
  - o Provide crosswalk enhancements at Oak Ridge Military Academy to make it safer for pedestrians to cross NC 150 (construct median crossing islands, stripe crosswalk markings, post pedestrian crossing warning signs, improve lighting) at a location in front of the school.
  - o Stripe 10-foot-wide travel lanes between Beeson Road and Bunch Road to shorten pedestrian crossing distances and visually narrow the roadway.



- In the long term, add shoulders to NC 150 throughout the Town of Oak Ridge, where appropriate.

2. Pleasant Garden

- Work with NCDOT to implement a "Main Street Retrofit" project on Pleasant Garden Road between Ryegate Drive and Sheraton Park Drive.
  - o Construct sidewalks along both sides of Pleasant Garden Road.
  - o Construct curb extensions across from Pleasant Garden Elementary School to shorten pedestrian crossing distance, improve pedestrian visibility, and reduce traffic speeds to make it safer for pedestrians to cross to the roadway.
  - o Stripe 10-foot-wide travel lanes on Pleasant Garden Road to shorten pedestrian crossing distances and visually narrow the roadway.
- Add sidewalks to both sides of roadways serving the subdivision near Southeast Guilford High School; give the highest priority to sidewalks on Southeast School Road and Woody Mill Road near the school.
- Add shoulders to Appomattox Road, and Liberty Road to provide better bicycle and pedestrian access to the park.
- Construct a multi-use trail/sidepath along Hagan-Stone Park Road to provide pedestrian and bicycle access to Hagan-Stone Park. This sidepath should connect to the multi-use trail that is recommended for the US 421 roadway corridor.

3. Sedalia

- Work with NCDOT to implement a "Main Street Retrofit" project on Burlington Road (US 70) between Bloomfield Road and Golf House Road West.
  - o Construct sidewalks on both sides of US 70 for the entire length of the project.
  - o Improve pedestrian accommodations at the intersection of Burlington Road (US 70) and Rock Creek Dairy Road (stripe crosswalks, add pedestrian countdown signals, construct median crossing islands, provide curb ramps and ADA improvements, reduce corner radii, improve lighting).
- As development occurs in the area, add shoulders and sidewalks on both sides of Bethel Church Road and Sedalia Road to improve bicycle and pedestrian access to East Guilford High School.

4. Stokesdale

- Work with NCDOT to implement a "Main Street Retrofit" project on US 158 between NC 68 and Belews Creek Road (NC 65).
  - o Construct sidewalks on both sides of Belews Creek Road (NC 65).
  - o Repave and maintain the existing shoulders on US 158.
  - o Improve pedestrian accommodations at the intersection of US 158 and Shilling Street (stripe crosswalks, provide median crossing islands, construct curb extensions, improve lighting).
  - o Construct crosswalks and median crossing islands at the intersections of US 158 and Vaughn Street and US 158 and Newberry Street (in addition to US 158 and Shilling Street).
  - o Ensure that sections of US 158 with curb and gutter have safe drainage grates and that the transition between the pavement and gutter is level and



smooth.
- o Provide new and improve existing curb ramps on US 158.
- o Improve lighting at all intersections and crosswalks along US 158.

5. Summerfield

- Work with NCDOT to implement a "Main Street Retrofit" project on Summerfield Road.
  - o Add sidewalks on both sides of Summerfield Road near Summerfield Elementary School
- Improve pedestrian accommodations at the intersection of US 220 and Auburn Road / NC 150 (conduct a signal study to determine if traffic signals and pedestrian countdown signals are warranted, stripe crosswalks on all legs of the intersection (if traffic signal is provided), provide curb ramps and ADA improvements, improve lighting for pedestrians, and provide sidewalks on both sides of all approaches to the intersection, including on both sides of US 220 for the entire length of the highway improvement project).
- Make pedestrian improvements to the intersection of NC 150 and Lake Brandt Road (stripe crosswalks, add pedestrian countdown signal heads, provide curb ramps and ADA improvements, improve lighting for pedestrians).
- Provide shoulders and sidewalks on other arterial and collector roadways in Summerfield as development occurs. Key roadways for these non-motorized transportation improvements include NC 150, US 220, Lake Brandt Road, and Summerfield Road.
- Improve pedestrian conditions at the intersection of Summerfield Road and Pleasant Ridge Road (stripe crosswalks, provide a right-turn separator island, improve lighting, and add sidewalks on both sides of all approaches to the intersection).



Conceptual Design Improvement Location: Intersection of Oak Ridge Road (NC 150) & Linville Road

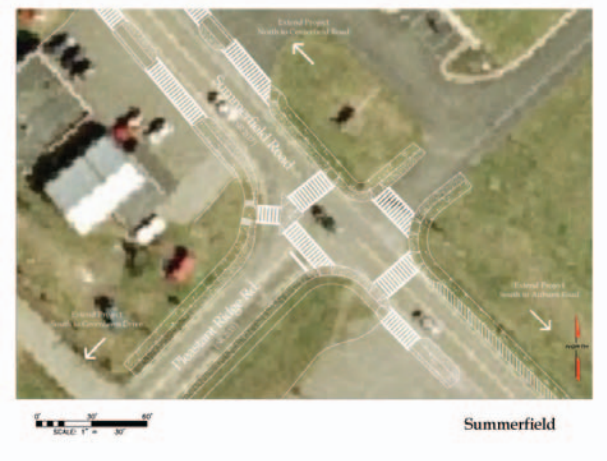
Conceptual Design Improvement Location: Intersection of Burlington Road (US 70) & Rock Creek Dairy Road

Conceptual Design Improvement Location: Intersection of Pleasant Garden Road & Neelley Road

Conceptual Design Improvement Location: Intersection of Belews Creek Road (US 158) & Shilling Street



Conceptual Design Improvement Location: Intersection of Summerfield Road & Pleasant Ridge Road



(Endnotes for 4.4)

[1] City of Greensboro police-reported pedestrian crash data, 2000-2004. 318 of the pedestrian crash reports included the location of the crash with respect to the roadway, and 70 percent of these were roadway crossing locations; 152 records did not have information about the crash location with respect to the roadway.

[2] Zegeer, C.V., *et al*. *Pedestrian and Bicycle Crash Types of the Early 1990s*, Federal Highway Administration, FHWA-RD-95-163, p. 22, June 1996.

[3] Zegeer, C.V., *et al*. *Pedestrian Facilities Users Guide: Providing Safety and Mobility*, Federal Highway Administration, FHWA-RD-01-102, p. 13, March 2002.

[4] Zegeer, C. V., J. R. Stewart, H. H. Huang, and P. A. Lagerwey. *Safety Effects of Marked Versus Unmarked Crosswalks*, Federal Highway Administration, FHWA-RD-01-075, February 2002.

[5] North Carolina Department of Transportation. "Pedestrian Laws of North Carolina." Available online at: http://www.ncdot.org/transit/bicycle/laws/laws_pedlaws.html.

[6] Zegeer, C. V., J. R. Stewart, H. H. Huang, and P. A. Lagerwey. *Safety Effects of Marked Versus Unmarked Crosswalks*, Federal Highway Administration, FHWA-RD-01-075, Feburary 2002.

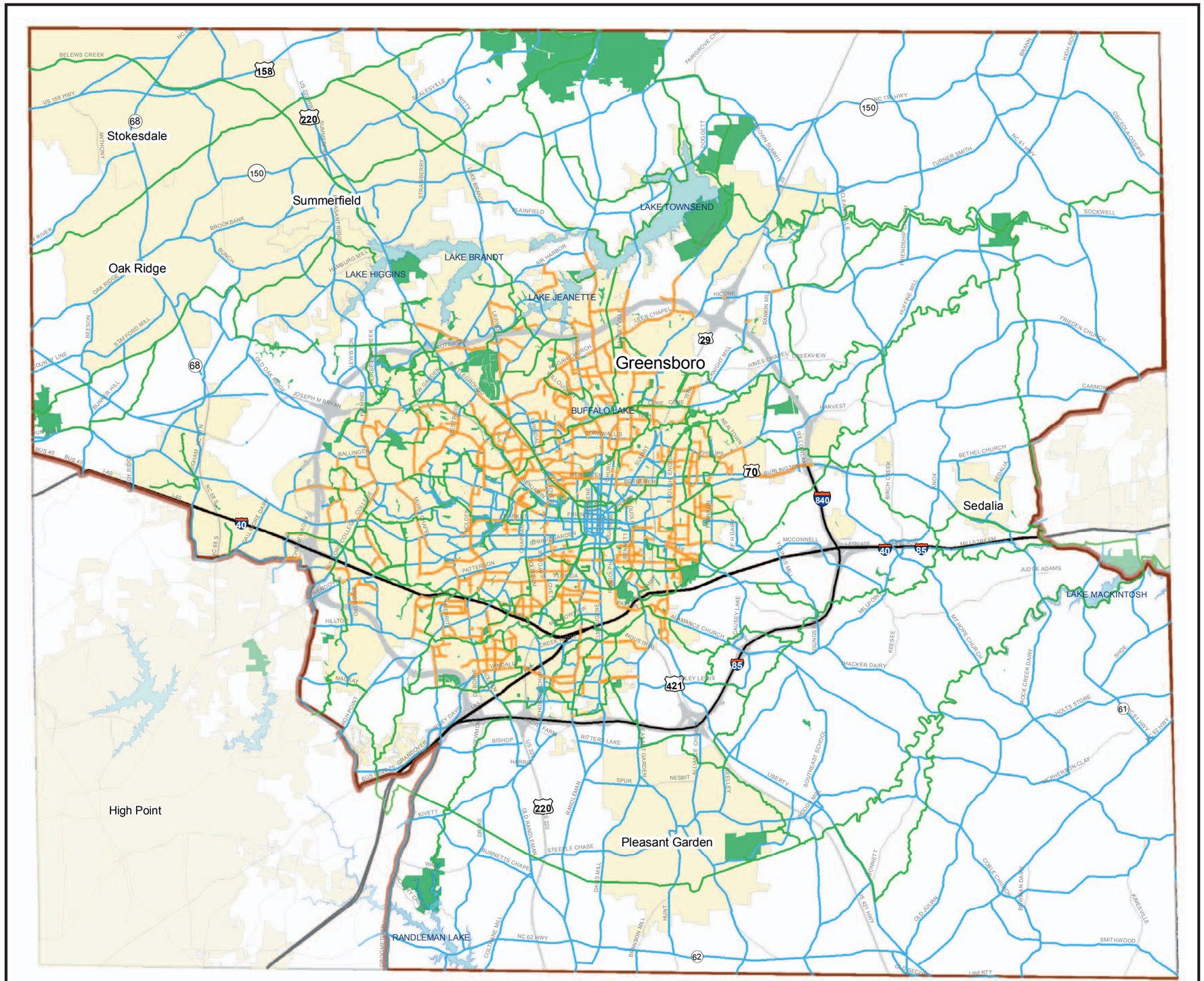


4.5 Integration of Bicycle, Pedestrian, and Greenway Network

While all three components of this comprehensive system require different approaches and different facilities, the integration of these components is essential for overall system connectivity and the long-term achievement of comprehensive alternative transportation, health and wellness, environmental, and recreation goals. Accomplishing a successful integration will require cooperation between agencies, especially the City of Greensboro Parks and Recreation and Greensboro DOT. This cooperation and strategy are discussed further in Chapter 7 - Implementation.

To accomplish the physical network integration, the following bulleted steps should be followed:

- Type V greenway facility corridors should be evaluated for proper bicycle and pedestrian facilities.
- Connectivity and linkages between all portions of the greenway, bicycle, and pedestrian network should be developed.
- Transition between greenway, bicycle, and pedestrian facilities should be safe and informative to users.
- An overall greenway, bicycle, and pedestrian map should be updated and made available to users.
- Programs, as described in Chapter 5, should reach out to all users on entire greenway, bicycle, and pedestrian network.
- User conflict resolution solutions and educational strategies should be developed as prescribed in Chapter 6.
- Proper maintenance should be conducted on all component facilities to ensure a comprehensive off-road and on-road network that is safe and enjoyable as described in Chapter 6.
- An Interdepartmental Committee, described in Chapter 7, should be formed to ensure integration of all components.



Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Map 4.8

Recommended Bicycle, Pedestrian, and Greenways Network

Legend

- Greenway Network
- Pedestrian Network
- Bicycle Network
- Urban Loop
- Interstate
- Major Roads
- Parks
- Incorporated
- Greensboro MAB
- Lakes

1 Miles

Data Source: City of Greensboro